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AUTHOR Patterson, Jo
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ABSTRACT

The guide for teachers of academically gifted elementary school children focuses on the provision of challenging learning experiences designed to involve the students as active participants. Compared are approaches to identification of the gifted such as use of intelligence scores, achievement test scores, and teacher or principal recommendation. Stressed for teachers is the establishment of a classroom climate which allows freedom of thinking. Examples are given of techniques used to teach creative thinking skills through mind stretchers (puzzles), creative activities (such as writing poetry), hypothesizing (about problems such as why an igloo doesn't melt inside), group dynamics activities (such as finding creative uses for unusual objects), analyzing propaganda, sentence reasoning, and logic elimination problems. Suggestions are given for effective questioning techniques for group discussions. Mini-courses on topics such as archaeology or the heart are seen to be particularly appropriate for gifted students. Independent research projects which might involve interviewing experts, taking field trips, and reading books are also recommended. Appended are a bibliography and a behavioral rating scale. (DB)

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WHY DOESN'T AN IGLOO MELT INSIDE?

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MEMPHIS CITY SCHOOLS - MEMPHIS, TENNESSEE

Project CLUE

Project CLUE*(Cooperative Leadership for Urban Education) was funded through a Title III grant of the Elementary and Secondary Education Act. The first of three annual grants by the U. S. Office of Education was effective December 1, 1969. The Metro Nashville system was the grantee.

Project CLUE was an effort on the part of Tennessee's four major school systems to cooperatively discover ways for solving problems common to urban education. The primary goal was the development of a model for achieving the involvement of urban students in learning strategies designed to change student apathy into positive action and channel student activism into responsible accomplishment. The four school systems involved in the project were Memphis, Nashville, Chattanooga, and Knoxville.

PROJECT CLUE

Robert G. Neil
Director
Metro Nashville Schools

Mrs. Jo Patterson
Memphis Component Coordinator

John Freeman
Superintendent
Memphis City Schools

Executive Board Members, Memphis City Schools:

W. D. Callian
Assistant Superintendent, Instruction

Maurice Roach
Director of Federal Projects

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*When Project CLUE as a state-wide Title III program was completed, the students were invited to develop a new meaning for the acronym CLUE to relate specifically to the Memphis program for academically talented and gifted. The title created by three fifth grade students at the Shady Grove Center was selected from the many suggestions. The acronym CLUE is now Creative Learning in a Unique Environment.

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WHY DOESN'T AN IGLOO MELT INSIDE?

A Handbook for Teachers of the
Academically Gifted and Talented

Jo Patterson, Coordinator
Memphis Program for the Academically Gifted and Talented
CLUE

Jeanette Saino, Resource Teacher
Johnnie R. Turner, Resource Teacher

Memphis City School System
2597 Avery
Memphis, Tennessee

1973

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FOREWARD

Project CLUE (Cooperative Leadership for Urban Education) which has been funded through Title III of the Elementary and Secondary Education Act, has represented an effort on the part of Tennessee's four major school systems to discover ways to solve problems common to urban settings.

The Memphis program has dealt with programs for gifted children and has been a highly successful model for the state and the nation to follow in developing programs for students that will stimulate creativity and creative thinking. This handbook is an example of the many hours of planning and implementation that have gone into the project. The Director of he project, other related administrative and supervisory personnel, tea ers, principals, community leaders, and especially the parents and the students who have participated are to be commended for their efforts in making the project highly successful.

The future of our society rests in the hands of many students who will be or have been involved in CLUE experiences. The students today are the leaders of tomorrow and the curriculum experiences that are related to identification, motivation, programs of studies, and evaluation provided in CLUE will give the necessary tools for these students to assume their responsibilities as the leaders of tomorrow.

Congratulations are in order for this handbook. Let us go forward. Believe in CLUE as a springboard for meeting the needs of the gifted.

Shelby Counce
Deputy Superintendent
Memphis City Schools

ACKNOWLEDGMENTS

We wish to acknowledge the contributions made by the many educators of the gifted who have served as consultants during the past three years. They have helped us in developing the curriculum contained in this handbook.

We wish to extend a special thanks to Sandra Berg, a consultant in the Memphis City School System and the former resource teacher in Project CLUE. Sandra created many of the illustrations and did much of the original work in the compilation of this handbook. We also wish to thank Janice Cobb for the illustrations she contributed.

Special acknowledgments should also go to the seminar teachers who have worked in the Memphis program and have been instrumental in creating and developing the activities included.

Seminar Teachers

Patricia Caldwell
Janice Cobb
Barbara Harris
Jade Marshall
Irma McGuffey, Knoxville
Ginny McQuirter
Marshall Mozingo
Peggy Perkins
Jeanette Saino
Johnnie R. Turner
Jo Ann Wallace

INTRODUCTION

The greatest challenge facing education is to provide every child with the opportunity to learn at his own rate and to develop his potential abilities to the fullest. For the teachers of the academically talented child, this challenge involves providing appropriate curricular experiences that will allow for the maximum development of his thinking, learning and creative abilities.

The Memphis Component of Project CLUE has sought to design and implement an educational program to meet the needs of academically talented students in grades four, five and six. The focus of the program is to involve the students, both as a group and individually, in learning experiences that will result in self-actualization and effective participation in society. The program also seeks to provide the superior learner with new and highly challenging learning experiences that are not ordinarily included in the regular classroom curriculum.

The Memphis program is organized on a semi-separation basis. Each week identified students attend two half-day seminar sessions at a designated center which serves several neighboring schools. These classes are scheduled for alternate morning and afternoon sessions. During the remainder of the school week, students spend their time in the regular classroom.

In the seminar setting the student operates as a self-motivated learner and the teacher as a guide and helper. No grades are given. However, there is continous evaluation of the student's performance

by the teacher and the student. The program is not compulsory.

During the initial stages of developing the CLUE program, it was found that there was no one source available that met the exact needs and objectives of our program. The teachers were faced with the necessity of compiling, adapting and creating curricular ideas from many sources. The purpose of this handbook is to share some of these techniques, materials, approaches and ideas that were developed by the seminar staff. All activities presented in this handbook have been tried and found to be effective in working with gifted and talented students in the Memphis program. It is also hoped that this handbook will serve its ultimate purpose as a guide for those interested in establishing a similar program.

In keeping with the over-all goals of the project, activities included are designed to involve the students as active participants in their own learning and to aid the students in the development of processes and skills that they can use in their life-long pursuit of knowledge.

In those instances where our ideas were adapted from other sources, acknowledgment has been made.

IDENTIFICATION OF THE GIFTED

Who are the gifted? What are they like? Is there a pattern by which they can be recognized?

The term "giftedness" has many different connotations. It may indicate outstanding mental ability or may be used to denote individuals who possess superior creative talent or aptitude in specialized areas. Giftedness encompasses all individuals who possess superior abilities.

In early research dealing with identification of the gifted, Terman and Hollingsworth used intelligence test scores to designate levels of ability. They classified intelligence levels according to the following scale:

The academically talented	above 115 I.Q.
The superior	above 125 I.Q.
The gifted	above 140 I.Q.
The highly gifted	above 160 I.Q.

A more recent definition has been developed for the Commissioner of Education and states that:

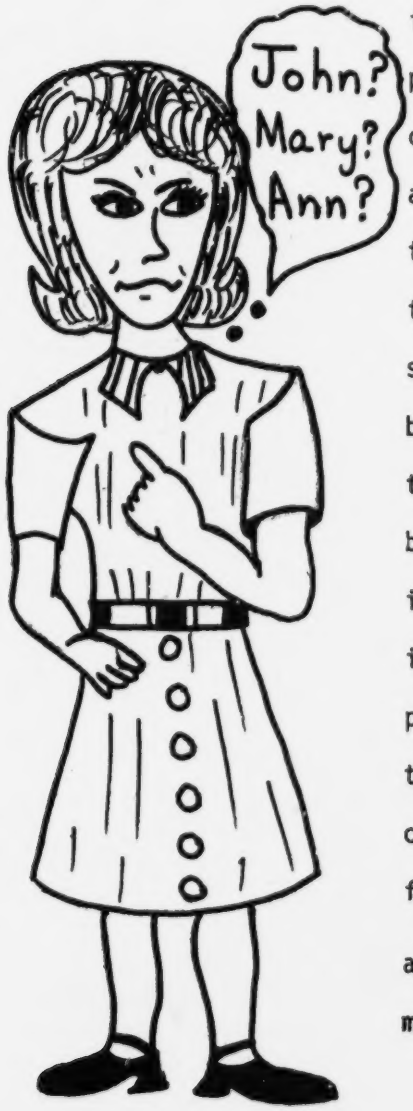
> "Gifted and talented children are those who are capable of high performance as identified by professionally qualified personnel. These are children who require different education programs and/or services beyond those normally provided by the regular school program in order to realize their full potential in contribution to self and society."

The term "high performance" has been definitively described through The Advocate Survey: A Survey of Experts in the Education of Gifted Children administered by Operations Research, Inc. According to this survey, gifted and talented children should exhibit high creative and productive thinking ability, general intellectual ability and specific academic aptitude. These children may possess high underdeveloped potential that needs to be stimulated so that they will be able to achieve their maximum potential. Students who have an I.Q. above 125 usually need the additional challenge that can be offered through differentiated education. The majority of respondents to the survey clarified the terms gifted and talented. They delineated as gifted those pupils with superior intellectual ability and as talented those with skills in particular areas such as art or music.

Gifted children have the same basic needs other children possess. Along with their above-average I.Q., they are often socially, emotionally and physically more advanced than their average counterpart. Because of their advanced development in one or more of these areas, we frequently fail to notice the need for reinforcement and understanding when the child is experiencing difficulty. Many errors in judgment are a result of the misconception of how the gifted student should act.

Although many do fit the stereotype of being enthusiastic, willing and cooperative, many do not! The child who is an "over-achiever or teacher-pleaser" may appear to be gifted, while the gifted, rowdy, non-conformist is thought of as a behavior problem with very little future potential. The undesirable behavior exhibited by some students may be a negative response to a dull classroom situation. Frequently a superior student's desire for excellence will not allow him to risk a mediocre or less than first-rate performance. This unwillingness to attempt a response, unless assured of success, may create anxieties and frustrations that are manifested by overt rebellion or withdrawal from the situation. Thus, we find it necessary to study the whole child, his learning characteristics, motivation, creativity and leadership ability, not just a standardized intelligence quotient.

Since there is a continuing debate on the validity of intelligence test scores, it is our belief that factors involving inaccurate test results and differences in ability related to socioeconomic background should be taken into consideration. Standardized achievement scores, with emphasis on reading achievement scores and group intelligence test scores, are used to help determine "giftedness". In addition to these formal means of identification, a high priority is given to teacher recommendations. Teacher judgment of student ability is obtained through the use of the Scale for Rating Behavioral Characteristics of Superior Students* and a series of open-ended statements completed by the classroom teacher. You will note that each item on the Rating Scale has been drawn from previous studies on identification of gifted students and includes negative as well as positive personality characteristics in each of the four areas: learning, motivation, creativity and leadership. Data collected from several sources prove the reliability and validity of the instrument. The method of identification of students in



*See Appendix

the Memphis program for gifted and talented takes into account the following:

1. Group intelligence scores, based on each school's median I.Q.

   Test results used include the Kuhlman-Finch given at the third grade level and the Lorge-Thorndike given at the fifth grade level. Students scoring 15 points above the school median are included in the pool for consideration.

2. Standardized achievement test scores in reading

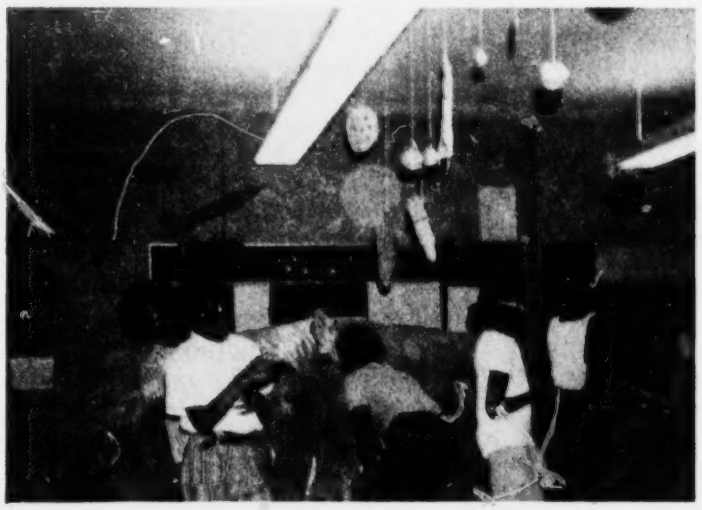
   Students reading two grade levels above their school median are also included in the pool.

3. Teacher and principal recommendations

   A high priority is given these recommendations. All students in the pool are evaluated by their teachers through the use of the Scale for Rating Behavioral Characteristics of Superior Students. Teachers may recommend any student they wish to have considered, regardless of reading or I.Q. scores.

ESTABLISHING CLASSROOM CLIMATE

The teacher is the most important element in establishing classroom climate. He does this in two ways. First, he must evaluate his own attitude and qualifications, and then he must prepare a classroom that will evoke the desired student reactions.



The atmosphere in the classroom must be one that will permit freedom of thinking. Creating this favorable atmosphere does not mean that the students are to be allowed to run wild. It means that they should be given the opportunity to act and interact with each other within the classroom setting, free from threats and teacher impositions. It means making the students responsible for their own behavior and making them aware of this responsibility. It involves the establishment of two-way communication lines between student and teacher so that each will be aware of the other's objectives. There must be mutual respect and concern.

The Seminar Teacher

Highly intelligent children have indicated that teachers who work with them should have many of the following characteristics:

Sense of humor
Flexibility
Patience, warmth
Consistent behavior
Personal magnetism
Cooperative and
democratic attitude
Sensitivity to others
Curiosity and desire
for additional knowledge
Wide interest
Knowledge in several fields

In analyzing the type of teacher that is needed, it would soon become obvious that an authoritative dispenser of knowledge would not be able to meet the many cognitive demands made by these students. Instead, a person who is willing to serve as a facilitator, guide, moderator and confidant is necessary. A teacher who has an understanding of the developmental stages of children will more likely be able to provide these students with meaningful experiences that will help them develop to their fullest potential both cognitively and affectively.

The teacher of the gifted must be comfortable in using the various techniques needed in teaching for the development of higher levels of thinking.

He should be able to accept the nonconforming ideas that characterize intellectual competence. The instructor who is threatened by a sense of inferiority and feels a sense of competition with these bright learners will not do well in the seminar classroom.

The Seminar Classroom

After it has been established that the teacher possesses the necessary requirements and mental attitude for working with these students, the teacher then begins to prepare a classroom that will excite creativity and inquiry and promote freedom of expression. The initial impression made by the teacher and the classroom itself will help to foster the desired reaction from the learners. The colorful and novel characters which decorate the room communicate that here indeed is the schoolroom that they have been seeking -- something new, different and exciting. The arrangement of the students' tables and chairs, as well as that of the teacher's desk, plays down the authoritarian atmosphere. The get-acquainted activities, general discussions, and provisions for the release of creative energies give the impression that this room and this teacher are going to be responsible for some happy, stimulating and unique experiences. Most seminar students arrive at each class session with an expression of eager anticipation -- "What will today's session bring?"

The following list of do's and don't's may be helpful reminders for achieving the appropriate classroom environment.

Do . . .

create an informal, relaxed atmosphere by having a flexible seating arrangement.

allow students a choice of activities.

make provisions for individual needs and interests.

offer students the opportunity to make decisions involving the entire group.

share ideas about respective roles and behavior.

place emphasis on individual and group responsibility.

create an environment which inspires and challenges.

use teaching techniques which cause children to think.

offer positive reinforcement.

use critique sessions to evaluate.

Don't . . .

dominate a classroom situation.

give negative nonverbal cues

waste time repeating student responses.

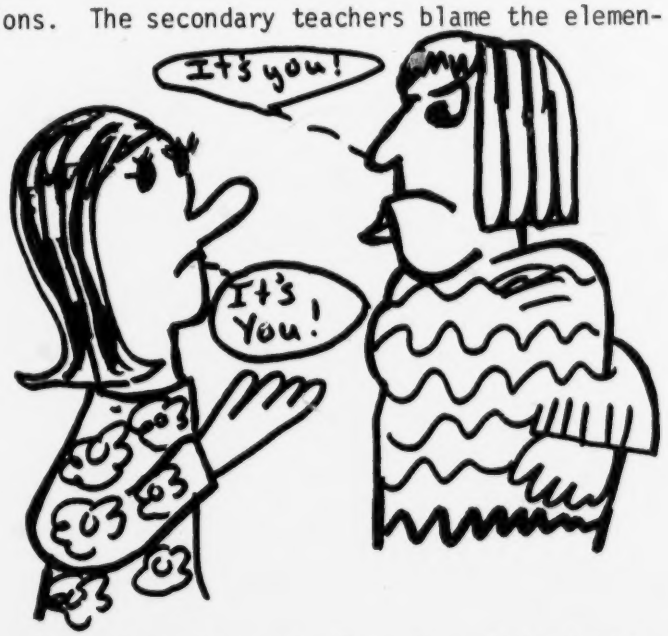
require formal classroom behavior (examples: handraising, assigned seats, etc.)

require a low noise level.

expect rigid conformity.

TEACHING FOR THINKING

Statements have often been made that many students cannot think for themselves, and that they are incapable of comprehending and analyzing ideas, concepts and situations. The secondary teachers blame the elementary teachers, and the elementary teachers either blame the teachers of the prior grade or rationalize by saying that the caliber of students they are getting is inferior. This circular road has been traveled many times before. Mere rhetoric or the "passing of the buck" approach does not give a solution to the problem of underdeveloped thinking skills. One logical approach to this problem is to teach for thinking. This may require a refocusing of our teaching to deal with the development of skills which will force the students to think. To achieve this end our curriculum should be geared to activities involving the students in experiences such as: interpreting data, summarizing information, stimulating the imagination, decision-making, problem-solving, making discoveries, formulating hypotheses, analyzing propaganda techniques and developing logical thinking.



Within this section are a variety of activities designed to teach for thinking. How is this accomplished? How do you teach for thinking?

Through Mind Stretchers

Mind stretchers or brain teasers are designed to give students a challenging and fun-like approach to the development of thinking skills necessary for the solution of puzzling problems. These activities stimulate thinking and allow the student to develop logical thought processes.

To lead students into developing critical thinking and to encourage creative approaches to the solution of mind stretcher problems, the following format is suggested:

1. Explain the objectives before beginning the activity --the teacher should mention the fact that he wants to do a better job of teaching the students to think.

2. Make sure students are relaxed --pressures are removed.

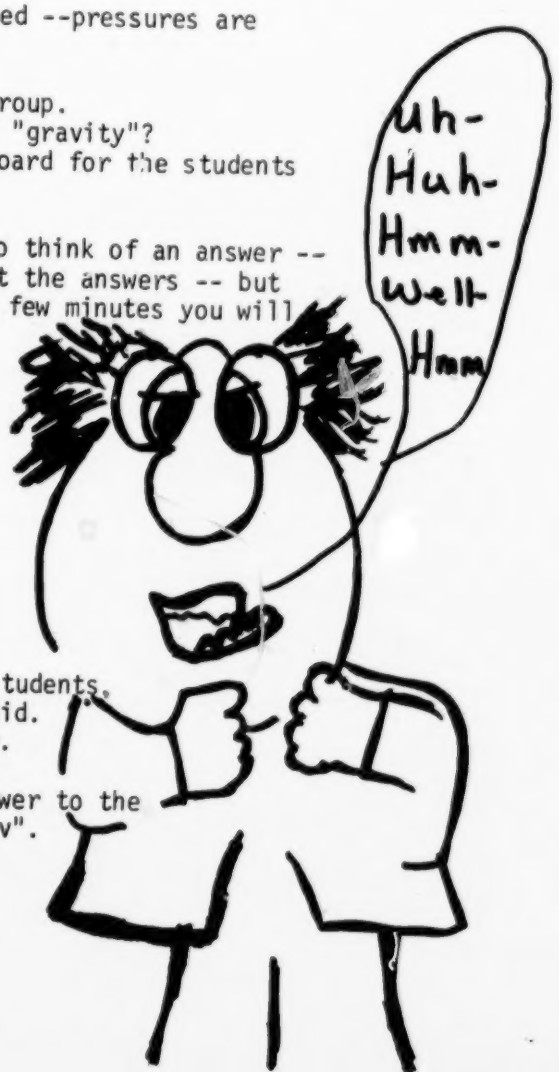
3. Present the problem to the group.
   Ex: What is the center of "gravity"?
   Write this sentence on the board for the students to answer orally.

4. Give the group enough time to think of an answer -- don't allow them to shout out the answers -- but mention that at the end of a few minutes you will hear their answers.

5. Listen to answers. Do not comment if someone gives the correct answer. (Most of the answers to the question will probably be science-oriented.)

6. Follow with a discussion.
   a. Probe to find out why students gave the answers they did.
   b. Give the correct answer.

   In our example, the answer to the problem is the letter "v".



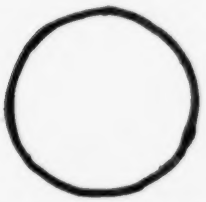
c. Emphasize that the majority of the students restricted their own thinking -- they limited themselves -- they did not explore all possibilities in seeking a solution. They restricted their answers to deal only with science.
d. Point out that the reason most people have trouble with thinking or reasoning is because they close their minds -- they deal only with the obvious and are afraid to go beyond.

The follow-up discussion of the student's thinking is very important. Do not minimize the significance of this step in increasing thinking ability within your classroom. Examples of other types of problems which can be used are listed below. The solutions to the problems can be found on the next page.

Problem 1

Connect these dots by drawing 4 straight lines without taking your pencil from the paper and without retracing.

Problem 2



By drawing 4 straight lines make as many triangles as you can on the circle.

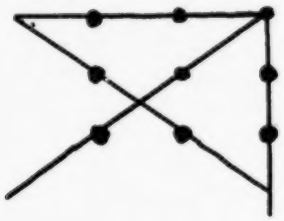
Problem 3

A lighthouse keeper once took a bath on the top floor. When he closed the door he found that it had locked automatically, and he couldn't turn off the water which rose rapidly, threatening to drown him. Suddenly he had an idea that saved his life. Can you figure out what it was?

Problem 4 A bottle and a stopper cost $1.10. If the bottle cost $1.00 more than the stopper, how much does the stopper cost?

SOLUTIONS:

Problem 1



The dot problem is solved by drawing lines beyond the dots. Most people think that this is not allowed, even though there is nothing in the instructions saying that you must stay within the boundaries of the dots.

Problem 2

The solution is reached by arranging the lines in irregular patterns as opposed to a neat, orderly, fixed pattern. You should be able to make 11 triangles within the circle.

Problem 3 Let the plug out of the tub.

Problem 4 The stopper cost $.05. ($1.00 more than $.05 is $1.05.)

$1.05	bottle
.05	stopper
$1.10	Total cost

All of the preceding problems should not be introduced to the students at one time. One a day can be used. Vary the method of achieving the objectives. The students might work in pairs or in small groups on the same problem. In the introductory lessons, however, have the students work independently. This is used primarily for impact in guiding them to analyze their own thinking.

Only five mind-bending problems are included here. Literally hundreds of similar type problems can be found in brain teaser books. These problems seem to have one thing in common -- they emphasize how people will mentally change the directions called for in a problem even though no change is called for. Therefore, in these first lessons, we are concerned with limitations people place on themselves when thinking. Generally, changes will occur as students loosen up and as experience is gained in trying different approaches. We have seen this happen time and again.

Through Creative Activities

> Creativity is like a spring of water,
> issuing from the ground, a nuisance at first
> because it creates a muddy quagmire... Find
> a channel for the runoff, then box in the spring.
> The ground around will become green and grassy...
> John Gowan

Creative activities are an attempt to provide a channel for the "rising springs" of creativity inherent in all children. These activities are designed to stimulate the imaginative and creative talents of students. They provide for the development of thinking skills through the thought processes which must precede any creative effort. Creative activities allow for the development of such factors in divergent thinking as fluency, flexibility, originality and elaboration. These factors are developed as the student generates a variety of ideas, chooses and discriminates from many alternative possibilities and then synthesizes and binds together the elements in new and original ways.

The fostering of creativity can best be accomplished through providing opportunities for the development of creative thinking. It can effectively be promoted in an environment that affords the child complete freedom to explore and discover, to experiment with new ideas, to have a voice in decision-making and to evaluate and express his verbal and nonverbal creative abilities.

Included within this section are examples of some of the activities developed and utilized by the CLUE staff to stimulate creative expression. Many of these are "fun-like" activities, which increases their appeal to the students. Opportunities are also provided for the more

formal expression of creative talents such as the writing of poetry and original stories. All these activities involve the student in exploring, questioning, imagining and modifying as new ideas are created and expressed in verbal or figural form.

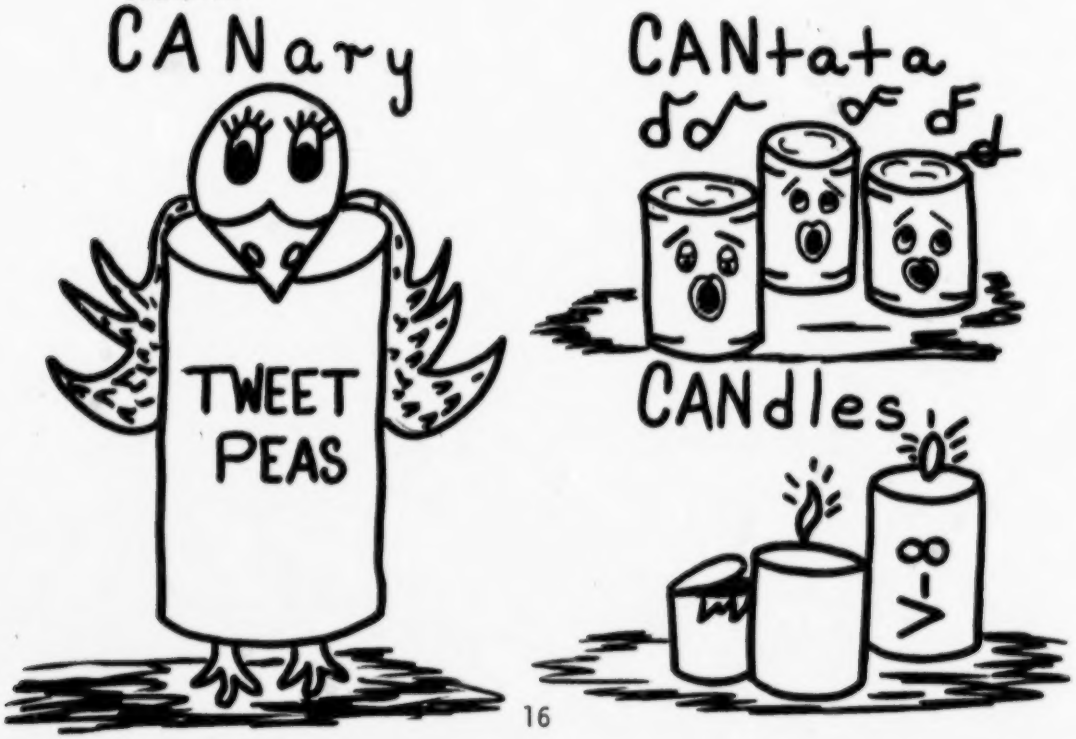
Activity #1 "Cantagious"

Where are empty, used cans found but in a garbage can? Many "cans" can also be found in words that you use everyday.

Now, what can you do with a can? That is your task for this activity.

1. Think of an unusual word with "can" in it.
2. Find the meaning of your word.
3. Illustrate your word in some creative manner to show its meaning.

Examples:

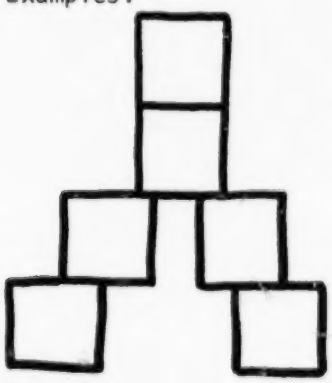


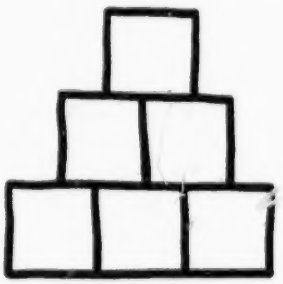
Activity #2 "Modular Building"

Simple objects such as building blocks can be used to foster creative thinking. The students are to imagine that each of these blocks is an apartment module. They are given the task of mentally constructing as many architectural designs as possible in a two or three minute period of time.

The follow-up consists of the sharing of these creative designs and further expansion of the original idea.

Examples:





Activity #3 "Eye Poems"

Directions to the students: "Think of a message you would like to leave mankind. The message may be washed ashore in a bottle one hundred years from now. What important message do you have for future generations?"

The students may cut out words and pictures from magazines to help illustrate their message. Then each message is glued on a large paper bag or colorful construction paper.

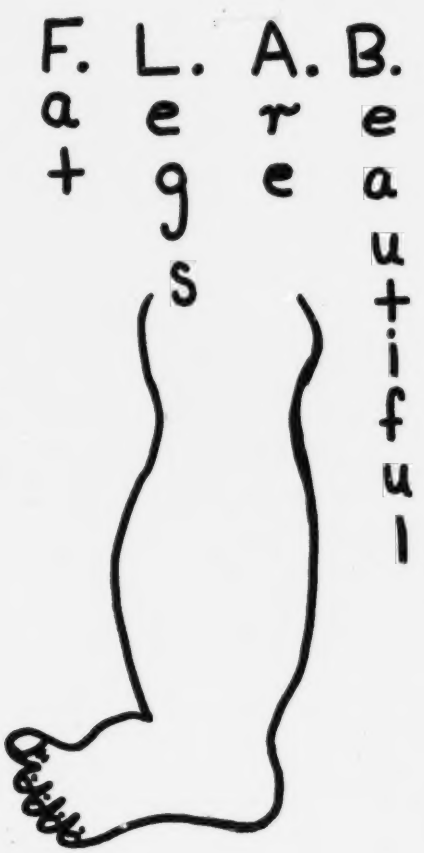
Activity #4 "Creacronyms"

A preliminary discussion should be held. Lead the students to discover what acronyms are. Provide examples of some of the most familiar ones such as TAG, HUD, WAC, etc. Let students contribute others in the general discussion group.

Explain that their task is to think of a group of letters which they could use to create an acronym. There are no limitations. Some creations can be humorous -- others serious. Just let your imaginations run wild!

After the acronyms are created, the students may illustrate them on colorful construction paper.

Examples:



Activity #5 Writing Poetry

The opportunity to develop their creative ability through the writing of poetry is a favorite with students. They especially enjoy the use of such poetic forms as cinquains, tankas, and acrostic poems.

1. Acrostic poems are poems of varied length and rhyme scheme. The unusual aspect of such poems is that the first letter of each line is part of a word which can be read vertically.

   Example: Silent the winds come a'bringing,
   Primroses, dogwood and heather.
   Rapidly winter has vanished;
   Into the past it is banished.
   Now in bright April weather,
   Go we to work lightly singing.

2. Cinquains are poems of five lines. The stress should remain on the thought to be expressed, but the unrhymed lines of the cinquain are supposed to fit these specifications:
   Line 1: One word (which may be the title)
   Line 2: Two words (describing the title)
   Line 3: Three words (an action)
   Line 4: Four words (a feeling)
   Line 5: One word (referring to the title)

   Example:
   Rainbow -
   Sky's umbrella,
   Turned upside down.
   Lovely splash of color,
   Aftermath.

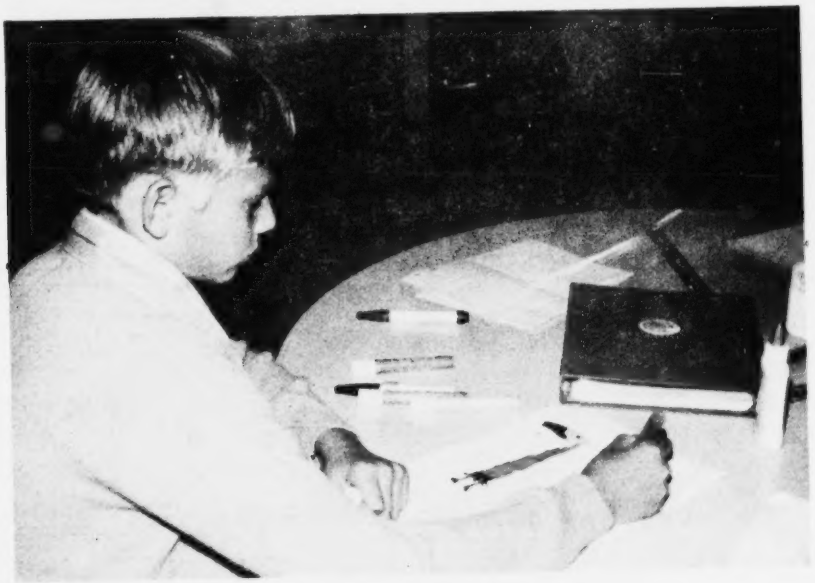
3. Tanka poems are five-lined Japanese poems which contain a Haiku (the first three lines). Like the Haiku, they are unrhymed and follow a well-defined syllabic pattern with a total of 31 syllables for the entire poem.
   Line 1: 5 syllables
   Line 2: 7 syllables
   Line 3: 5 syllables
   Line 4: 7 syllables
   Line 5: 7 syllables

   Example:
   Silver raindrops fall:
   A puddle of water stands.
   Ocean before me,
   All the world is reflected.
   Look hard and you see black mud.

Listed below are sources of additional creative activities:

1. Making It Strange Series, Harper and Row, New York, 1968.
2. Creative Enrichment by Dr. James D. Hoffman, The Instructional Fair, Inc., Grand Rapids, Michigan, 1967.
3. Classroom Ideas for Encouraging Thinking and Feeling by Frank E. Williams, Buffalo, D.O.K. Publishers, Inc., 1970.
4. Booklets on creative ideas by R. E. Myers and E. Paul Torrance, Ginn and Company, Boston, 1964.

In addition to the creative activities mentioned here, the seminar student is provided opportunities to express his creative abilities through the use of the media. An original story may become a slide and tape production, a filmstrip or an animated movie. An original play may become the subject of a production utilizing the video tape recorder. (More information about the use of the media is included in the section entitled "Independent Projects".) The provision of various media serves to stimulate the creative talents of the seminar student as he strives to produce an unusual product.



Through Hypothesizing

Activities that are good for promoting thinking are those that provide students with experiences in hypothesizing. Formulating hypotheses requires the application of previous knowledge to a new situation in attempting to arrive at logical conclusions. Reasoning skills are developed as the student analyzes the problem, divergently arrives at many possible solutions and through the process of elimination arrives at an acceptable conclusion. Consider such questions as: Why is the water in the ocean salty? Why doesn't an igloo melt inside? Why do we walk in circles when we are lost?

The preceding are ordinary questions which we all take for granted. However, they can serve a very useful purpose if utilized innovatively. A suggested format for giving students experiences in hypothesizing is as follows:

A. Put students in groups of 3-4 or 5-6.

B. Explain to the students that each group will get a slip of paper with the same question on it.

C. Allow a five (5) minute period for each group to think of as many hypotheses as possible to explain the question given them.

D. Give the students one of the above questions on slips of paper. Ex. "Why doesn't an igloo melt inside?"

E. Allow the group to select one person to record the answers.

F. Give the group with the most answers ten (10) points at the end of the first timed period. In case of ties, each group will receive ten (10) points. No duplications are allowed, i.e., the same answer cannot be reworded.

G. Give each group 5 to 6 minutes to review their hypotheses in order to add to the list.

H. Add 5 points to the group with the most answers at the end of the time period.

I. Redefine the task. Each group is asked to pick from their list the hypothesis they think most likely approximates the answer. 10 - 12 minutes should be allotted for this portion of the lesson. Each group will have to decide, as a group, what their answer will be.

J. Allow each group to read its final answer.

K. Allow other groups to challenge or ask for clarification.

L. Give each group the opportunity to discuss the hypotheses presented and choose the one they think the most plausible. The recorder writes down the group's choice.

M. Read the correct answer, or allow the groups to do research to find the correct answer.

Answer to question, "Why doesn't an igloo melt inside?"

Even though stone and wooden houses have

become more popular among the Eskimos, they still construct the igloo for special occasions or while on a journey. It is quickly built, and it defies any kind of weather.

First a trench is cut about 5 feet long and 20 inches deep in a newly made snowdrift. Then, from the face of the trench, blocks are cut with a knife. These are shaped so that they lean inward when set on edge.

A circle of these snowblocks is laid and then shaved down so that as the Eskimo builds there will be a narrowing spiral. The material is cut from the inside of the house as the man works. Then a keystone, with edges wider above than below, is dropped into the space at the top. Then all the cracks are filled in with soft snow. A small igloo can be built in this way in a couple of hours.

When the house has been built, the woman takes over. She lights her blubber lamp and makes it burn as hot as possible. Then she closes the door with a block of ice and makes everything airtight. Now the snow begins to melt. But because the dome's roof is curved, it doesn't drip. Instead, it soaks gradually into the blocks so that they are nearly wet through.

When the blocks are sufficiently wet, she puts out her lamp and opens the door. The intensely cold air rushes in, and in a few minutes, the house is transformed from a fragile building of snow to a dome of ice! It is now so strong that a polar bear can crawl over the roof without breaking it in. And because it is so solid and hard, it doesn't melt and provides a snug shelter.

Of course, when the winter ends and the temperature rises, the igloo does begin to melt, and it is usually the roof which first caves in.*

N. Award the group(s) that chose the hypotheses that were most nearly correct ten (10) points.

O. Give the group(s) that have correct responses twenty (20) points.

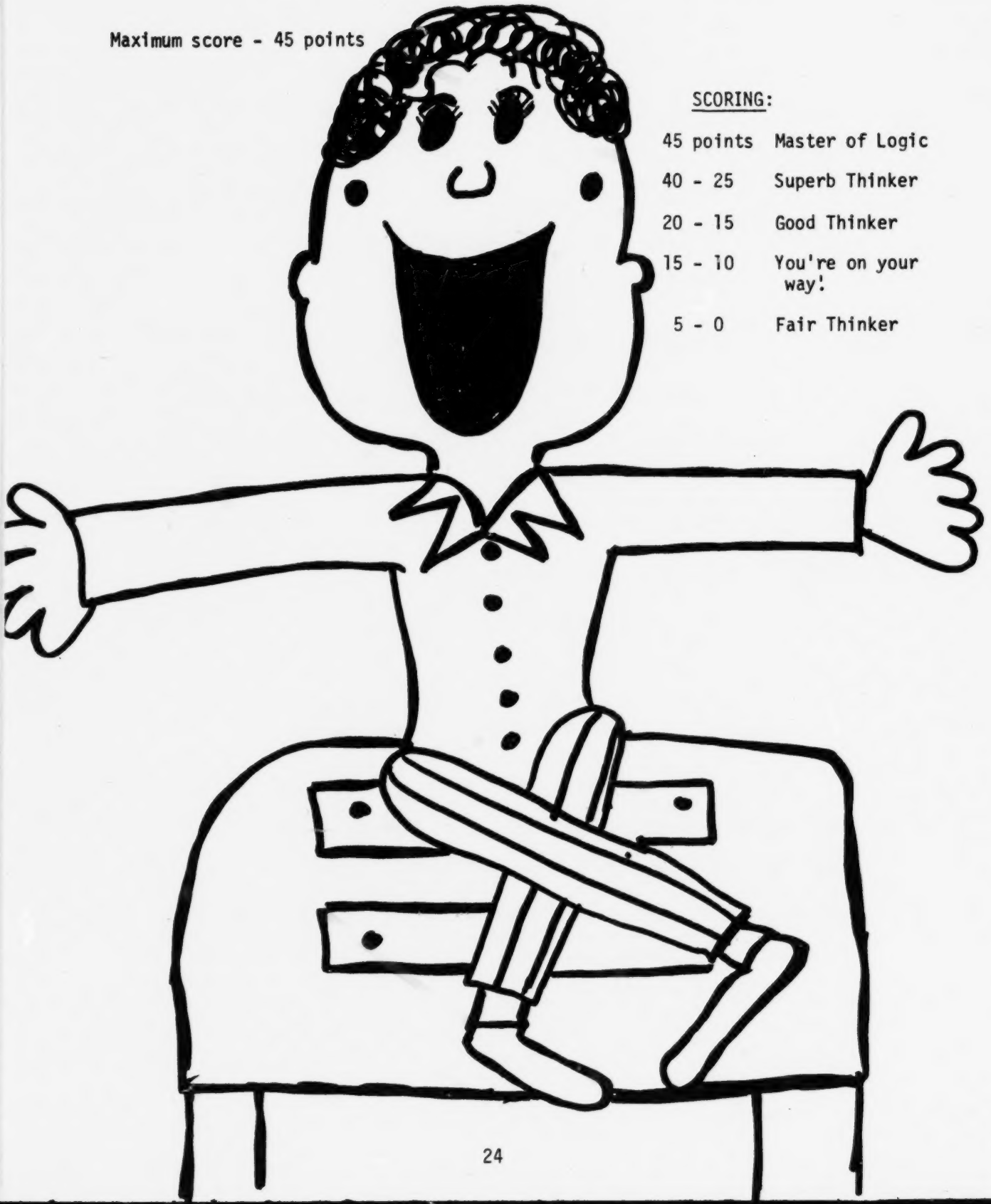
P. Discuss the reasons for the correct answer.

*Reproduced from The Question and Answer Book of Everyday Science by Ruth A. Sonneborn, Random House, 1961.

Maximum score - 45 points

SCORING:

45 points	Master of Logic
40 - 25	Superb Thinker
20 - 15	Good Thinker
15 - 10	You're on your way!
5 - 0	Fair Thinker



Questions such as those included in this section not only can serve as a means for getting students to think through forming hypotheses, but will often lead to the development of an interest in the subject being hypothesized and will result in more in-depth research. Listed below are additional sources of questions to give the students experience in hypothesizing.

1. Lots More Tell Me Why by Arkady Leokum, Gossett and Dunlap, 1972.
2. Questions and Answer Book of Nature by John R. Saunders, Random House, 1962.
3. Questions by May Garelick, Scott Publishing Co., 1955.

The following example is another type problem which can be used to develop hypothesizing. It allows the student to consider many alternatives, as there is no one correct answer. Any answer which is logical can be accepted.

> A bird fell into a 30" hole in the cement block wall of a garage under construction. The hole was only 4" by 1 1/2", and the workmen were stumped as to how to get the robin out.
>
> A ten year old boy walking by came up with a simple solution to rescue the robin. How did he do it?

Experience in hypothesizing can also be provided with concrete materials as well as abstract ideas. For example, students can form hypotheses concerning the use of an unfamiliar object. In some of our sessions, we have used a cigar press or an artifact from prehistoric times for this purpose.

Through Group Dynamics Activities

Group dynamics activities are designed to involve the students in decision-making as they work in groups in attempting to solve problems. The introduction of a problem elicits a great deal of student discussion and the expression of a variety of viewpoints. The students engage in divergent as well as convergent thinking as they seek to find the best solution to a problem.

Group dynamics can be used to develop critical thinking because the student must be able to analyze, synthesize and evaluate the various points of view in reaching an acceptable conclusion. These activities should be presented in such a way that the students are encouraged to approach them as an adventure in thinking. Group dynamics give the individual student opportunities to perform such intellectual operations as defining a problem, drawing logical inferences, analyzing statements and generalizing. The importance of the follow-up discussion cannot be stressed too strongly. It is here that students engage in thinking processes which will help them to clarify the purpose for the activity, decide what made the activity successful or unsuccessful and determine how improvements could be made.

Included within this section are examples of two types of group dynamic activities that we have used successfully with our students. A suggested format for the presentation of these kinds of activities is as follows:

1. Divide the class into groups. Explain that the purpose of the activity is to give them experience in working within groups in seeking to solve a problem.
2. Give each group the problem to be solved.
3. Emphasize the type of thinking skills which should be used, i.e., making inferences, analyzing data and synthesizing.
4. Allow time for each group to work on the problem. Sometimes the problem will be one that can best be solved by letting the entire class work as a group.
5. Call groups together and let each group analyze the different approaches used to solve the problem. Look for unique and novel approaches, original thinking, etc.

Problem 1

"The Dump Game"

Instructions for "The Dump Game" (Town of Middleboro)

Problem: Where do we build the incinerator? (Give each student a copy of the map enclosed)

The town of Middleboro has a rubbish disposal problem. Until now, everyone has taken care of his own trash, with the result that the town lands, the marsh, the quarry, ponds, stream, beach and forest have become quite littered, polluted and unattractive. The store areas are

dirty and infested with rodents. Individual burning of trash is becoming a health hazard.

Money has been assigned for the construction of a town incinerator. A town meeting is to be held to decide where it is to be built. Its location must have the approval of a majority of four-fifths of the members of the community.

Each student is to pretend to be the owner of one of the properties lettered A-Z, the dairy, golf course, garage, lumberyard, gas station, or represent the school or the church. He is to shade in lightly with pencil his land on the map.

The student is given time to work out solutions that reflect his own interest. At the town meeting we are going to see whether the residents can agree upon a single solution.

Help may be given by having the student consider various locations for the incinerator and what it would mean to the people of Middleboro.

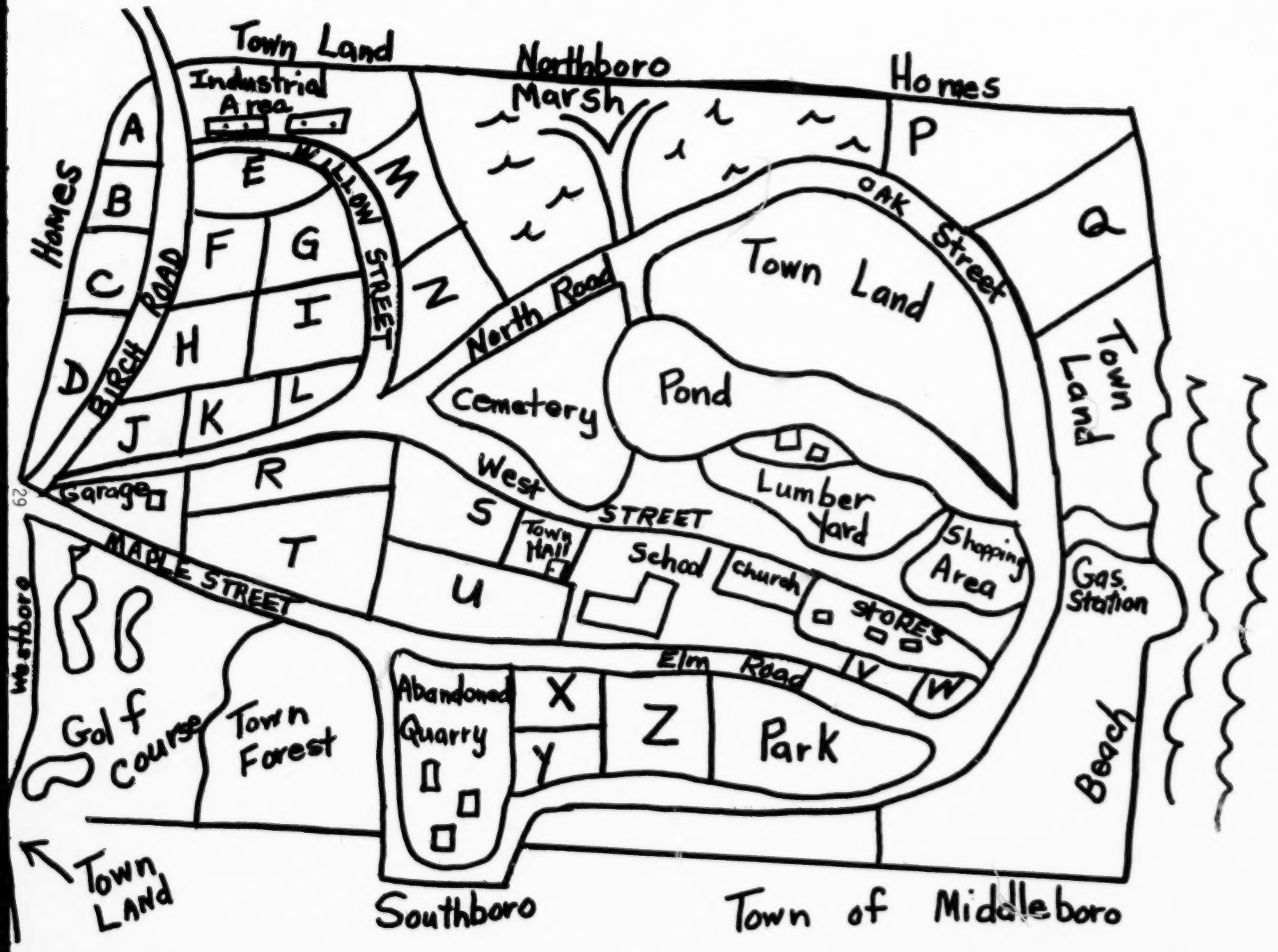
Suggested questions for students in the follow-up discussion.

1. How did you actually make the decision? Was this a democratic way to decide? How does it compare to the way decisions occur in real town meetings, the United States Congress, etc.?

2. What kinds of things motivated your actions? What role did information, personalities, alliances, play in the decision-making process? Do you think these things influence other decision-making situations?

3. How was power distributed and used? What kinds of power were there?*

*November, 1971 Vol. 35 No. 7 - Social Education


Town Land
Northboro
Homes
Industrial Area
Marsh
Homes
A
B
C
D
E
F
G
H
I
J
K
L
M
N
P
Q
Birch Road
Willow Street
North Road
Oak Street
Town Land
Cemetery
Pond
Town Land
Garage
R
S
T
U
West
Street
Lumber Yard
Shopping Area
Gas Station
Town Hall
School
church
stores
Maple Street
Elm Road
V
W
X
Y
Z
Park
Beach
Abandoned Quarry
Golf Course
Town Forest
Westboro
Town Land
Southboro
Town of Middleboro

Problem 2

Before the students divide into groups to solve the problem presented in this activity, a discussion should be held on the topic of "Fads" with questions such as:

1. What is a fad?
2. How does something become a fad?
3. Why are fads short-lived?
4. Can you think of any fads?

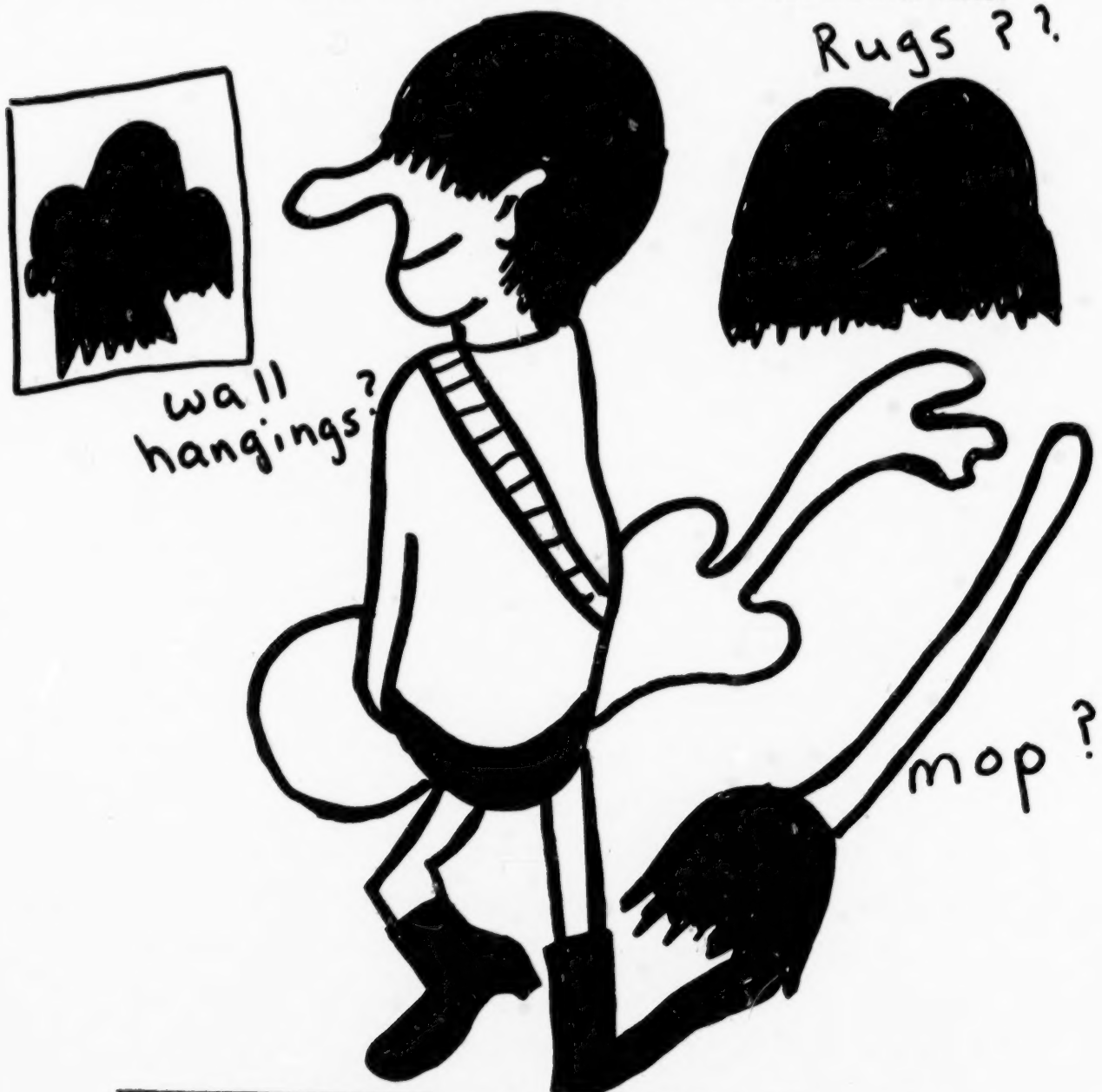
Davy Crockett sweaters
College students swallowing goldfish
Boys and girls wearing saddle oxfords
Wearing socks of different lengths

BEATLE WIGS

Do you remember when the Beatles were the singing rage of the Nation? Every teenage girl wanted something which reminded her of the Beatles. Well, store owners capitalized on this by stocking their stores with items which did just this---appealed to the Beatle fans. Among these items were Beatle wigs. Now just imagine that you are a store owner, and you have just received a shipment of 100 boxes of Beatle wigs with 100 wigs in each box. Since your order was originally placed, however, popularity for the Beatles has dropped to the extent that only occasionally are you making any sales on Beatle items.

Now you have a problem---10,000 wigs and no one interested in buying them. But all is not lost!!!!!!! With a few creative ideas a financial disaster can be turned into a tremendous success.

The task of each group is to come up with as many creative ways as possible to use the Beatle wigs in different ways or as different products. Then we will select the group with the most creative ideas.*



*Idea adapted from "Covering Up" from Plots, Puzzles and Ploys by R. E. Myers and E. Paul Torrance.

Through Analyzing Propaganda

Teaching for critical thinking requires that the student be made aware of the various techniques and devices which are used to influence him to believe certain ideas and to follow certain courses of action. The mass array of media, coupled with advanced communication techniques, increases the opportunities for the student to be exposed to propaganda in its various forms. Since propaganda often tries to persuade him to buy worthless products, to accept illogical statements, to vote for persons unqualified for certain elective positions and to accept questionable points-of-view, we feel that the gifted student should become familiar with various propaganda techniques that are used to influence his thinking.

Propaganda plays a very important role in the life of all individuals. When we attempt to convince others to support an idea or a cause, we are engaging in propaganda. As others attempt to persuade us to agree with their way of thinking, they are engaging in propaganda. Before accepting or rejecting the ideas, they must be evaluated. Therefore, it is important that the student be taught how to think clearly about the ideas that are presented to him daily. He must be taught to analyze and evaluate critically each statement in terms of its validity and logic.

To teach for thinking through an analysis of propaganda, the Memphis program for the academically talented makes use of the game

"Propaganda"*, a favorite with our students. It is a game designed to introduce the players to some of the techniques used to distort the thinking process. Through this game approach, the student is taught how to identify various propaganda techniques. He then utilizes this knowledge as an aid in helping him evaluate and analyze the information given to him. The basic goal of the game is to foster greater clarity in thought..

An example of the treatment of propaganda techniques as used in the game is as follows:

Under the section entitled "Techniques of Irrelevance", the technique of "appearance" is presented with an example and its meaning.

Example:
A floor wax nationally advertised on television is shown in the commercial being applied to a floor with the immediate result of a brilliant luster. The viewer does not know that the floor has been buffed and polished for days, and then dust coated just before the wax was applied in the commercial.

Meaning:
The appearance of a thing (or person) is made the basis of our acceptance or rejection without any thought that this appearance may be a deceptive indicator of value.

*The Propaganda Game by Robert W. Allen and Lorne Greene Autotelic Instructional Materials Publishers, New Haven, Connecticut.

All of the techniques under this heading are presented in a similar manner. The student is then presented with a series of techniques on example cards that he must identify. He plays the game according to the directions. In addition to using propaganda as suggested in the game, the students also use propaganda techniques in creative dramatics, art and language-related activities.

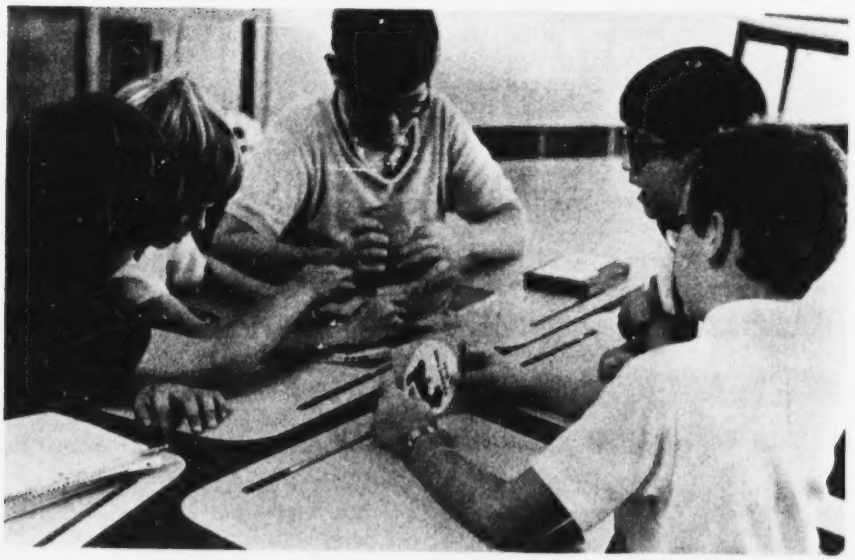
Examples:

A. Creative dramatics - Have a group of students take one of the techniques and create a skit showing the use of this technique.

B. Art - Have students illustrate a particular propaganda technique to create an advertisement promoting an original product.

C. Language - Have students analyze political statements, newspaper and magazine articles, etc. in terms of their use of propaganda techniques.

Also, have them analyze appropriate television and radio programs. Commentaries are excellent for this purpose.



Through Sentence Reasoning

In addition to the use of the propaganda game mentioned in the previous section, the Memphis Program also introduces the student to the study of logical reasoning through a series of rules of correct thinking. People are always trying to persuade others. Generally, you are presented some information and are told to draw a conclusion based on that information. Sometimes this can logically be done, sometimes not. The rules of thinking introduced to the student are designed to help him decide when such conclusions may correctly be drawn from the information which is presented to him.

First, the student is introduced to the following terms: argument, premise, conclusion, valid and invalid.

An argument consists of one or more premises and a conclusion based on the premises. A premise is each statement within an argument that provides you with information. A conclusion is a final statement derived from the information in the premise(s). For the purpose of this study, we will assume that the information contained within the premise is true. Therefore, an argument will consist of some information we will assume to be true and a conclusion based upon this information. In the argument below, the premise is underlined once and the conclusion twice.

Saturn is larger than earth. Earth is larger than Mars. Therefore Saturn is larger than Mars.

An argument is valid if the conclusion follows necessarily from the premise.

Example: Horses can fly higher than dogs.
Dogs can fly higher than birds.
Therefore, horses can fly higher than birds.

We know, of course, that horses cannot fly higher than birds. BUT, if we pretend that the information contained in the premises is true, then the information contained in the conclusion must also be true. Therefore, this argument is VALID.

An <u>invalid</u> argument is one wherein the relationship is such that if you accept the premises, then you don't necessarily have to accept the conclusion. Maybe you simply were not given enough information in the premises in order to be certain about the conclusion.

Example: Jerry likes Susan.
Susan likes David.
Therefore, Jerry likes David.

This argument is invalid because the conclusion "Jerry likes David" does not have to be true. The premises do not tell enough to be certain about it.

After these terms are introduced and understood by the student, he is then introduced to several rules of thinking which he can apply to arguments to determine whether they are valid or invalid.

Rule 1 If A, then B
A
Therefore, B

A
<u>If</u> I watch the late movie,
B
<u>then</u> I will stay up too
A
long. I watched the late
movie. <u>Therefore</u>, I stayed
B
up too long.

Rule 2 If A, then B
If B, then C
Therefore, if A, then C

If it snows, then the streets will be slippery. If the streets are slippery, then the school will be closed. Therefore, if it snows, then school will be closed.

Rule 1 & 2 combined If A, then B
If B, then C
A
Therefore, C

If Charles gets sick, then he cannot go on the field trip. If Charles cannot go on the field trip, then he will not see the circus. Charles got sick. Therefore, he will not see the circus.

Rule 3 If A, then B
Therefore, if not B, then not A

If, today is Sunday, then I will go to church. Therefore, if I do not go to church, then today is not Sunday.

Rule 4 If A, then B
Not B
Therefore, not A

If today is Sunday, then I will go to church.
I did not go to church.
Therefore, today is not Sunday.

The first four rules presented here are all examples of arguments which are valid. In other words the conclusion necessarily follows from the

premises. The next two rules of thinking are examples of invalid arguments. Note that our definition of an invalid argument was that it was an argument in which the conclusion does not follow necessarily from the premises. The conclusion may or may not be true. There simply is not enough information given to be certain. Rules 5 and 6 which follow are examples of this.

Rule 5

If A, then B
B
Therefore, A

If I break my arm, then I will go to the doctor.
I went to the doctor.
Therefore, I broke my arm.

This argument is invalid because the fact that I went to the doctor does not necessarily mean that I broke my arm. I could have the flu. There simply is not enough information given. Therefore, the argument is invalid.

It is important to understand the difference between rule 5 and rule 1.

Rule 1	Rule 5
If A, then B	If A, then B
A	B
Therefore, B	Therefore, A
VALID	INVALID

In the first case, we can draw a definite conclusion. Therefore, the argument is valid. In rule 5, however, we can not draw a definite conclusion. Therefore, this argument is invalid.

Rule 6

If A, then B
Not A
Therefore, not B

A B
If today is Sunday, then I will go to church.
A
Today is not Sunday.
B
Therefore, I will not go to church.

This argument is invalid because even though today is not Sunday, it does not mean that you will not go to church. You could attend a Monday night church meeting. The only thing of which we are certain is that if today is Sunday, then I will go to church no matter what happens. Enough information is not provided in the second premise to justify the conclusion.

In the presentation of the various rules of thinking, it is important to provide enough examples so that the students will thoroughly understand each rule before progressing to the next.

The material within this section was adapted from an enrichment unit developed by the Hartford Regional Planning Program for the Academically Gifted Child entitled A Study Guide for Sentence Reasoning.

Through Logic Elimination Problems

Logic elimination problems are designed to develop critical thinking. They require the application of native mental ingenuity in the solution of problems rather than the simple recall of stored information. These problems are rather common. However, most people have difficulty with them as they seem confusing, contradictory and, at times, unrelated. They can serve a valid purpose if treated as a scientific process to increase thinking "expertise."

Often gifted students are presented with material both in school and out that, if not handled logically, can present problems. For example, let's take an article in the newspaper. If the student in reading the article is too quick in forming an opinion, he often will reach an invalid and illogical conclusion based upon the material contained within the article. On the other hand, if the student carefully eliminates truth from half-truths, fact from innuendo, then we might say that he has reached some maturity in his thinking process. Other parallels might be made in areas such as math, essay writing, objective tests, classroom discussions and science. In each of these areas the student is confronted with a problem for which he must seek a solution. He makes hypotheses which must be tested and retested. If proven wrong, they are eliminated. Thus, through the process of elimination, he is able to arrive at a logical conclusion. Basically the same scientific process is used in elimination-type logic problems. A suggested format for introducing this type of problem is as follows:

A. Give each student a copy of a problem, such as the one below, and pencil and paper.

Problem:

In a certain bank the positions of cashier, manager, and teller are held by Brown, Jones and Smith, though not necessarily in that order.

The teller, who was an only child, earns the least.

Smith, who married Brown's sister, earns more than the manager.

WHICH POSITION DOES EACH MAN FILL?*

B. Tell students that this is another type of problem that will help them improve their thinking processes.

C. Ask students to individually find a solution (allow about 15 minutes).

D. Walk around the room to find techniques students use to solve the problem.
   1. Is there any logical method to their attack?
   2. Do you notice any creative attempts to solve the problem?

E. Call time at the end of 15 minutes.

F. Check by asking the students if anyone solved the problem.

G. If someone did, ask for an explanation.

H. Discuss interesting attempts at solving the problem that you noticed when you walked around the room -- particularly the logical methods.

I. Now show the students a logical way to solve this type of problem using a grid.

Make a grid on the board and work through orally as you mark the answers.

Solution to Problem

Names	Cashier	Manager	Teller
Brown	X	0	X
Jones	X	X	0
Smith	0	X	X

*101 Puzzles in Logic and Thought by C.R. Wylie, Jr., Dover Publications Inc., New York, 1957.

1. You know Smith is not the manager because it says Smith earns more than the manager. Therefore, put an "X" in the block across from Smith's name under manager.

2. You also know Smith is not the teller as the problem states the teller earns the least. We already know Smith earns more than the manager. Therefore, Smith is not the teller nor the manager, so he must be the cashier. Put an "O" in the box across from Smith's name under cashier to indicate that he is the cashier. Now put "X's" in the boxes across from Brown's and Jones' names under cashier. We know they are not the cashier, as we have just proven that Smith is.

3. Now if the teller is an only child, then he is not Brown, as Brown has a sister. Therefore, put an "X" in the box across from Brown's name under teller. By the process of elimination, we have just proven that the only thing left for Brown to be is the manager. Therefore, put an "O" in the box across from Brown's name under manager to indicate that he holds this position.

4. If Smith is the cashier -- and Brown is the manager -- then Jones must be the teller.

Another example of elimination type logic problems is as follows:

There are three men named Tom, Dick, and Harry who are going on an archaeological expedition. Each of the men has two occupations. The occupations are geologist, photographer, archaeologist, writer, sociologist, and paleontologist. From the list of facts below see if you can find the two occupations of each man.

1. Both the paleontologist and the sociologist used to go hunting with Tom.

2. The photographer borrowed a book from the archaeologist.

3. Harry beat both Dick and the photographer at chess.

4. The geologist offended the paleontologist by laughing at his mustache.

5. The geologist courted the photographer's sister.

6. Dick owed the sociologist some money.

Solution:

Tom is the photographer and writer.

Dick is the archaeologist and paleontologist.

Harry is the geologist and the sociologist.

The two (2) problems presented here are merely suggestions. However, we strongly recommend that you start with 5 to 6 problems of a similar nature. The first lesson, for example, could have only 3 names and 3 occupations. The next series of lessons could have 4 names and 4 occupations. Once the students get the idea of how they can use the process of elimination to arrive at the solution, they can advance to more complex problems.

GROUP DISCUSSIONS AND EFFECTIVE QUESTIONING TECHNIQUES

The discussion group in all its forms, whether free or probing, is a central feature in the seminar class. It is here that some of the basic skills in communication are learned and cultivated. The informal group setting also provides experiences for the cultivation of an awareness of the feelings of self and others, and of observing how these feelings are expressed by different persons. The discussion group often includes the entire class. At other times smaller groups are formed. Each has its place in the learning and improving of communication skills. In the group context much can be learned; much can be shared, and many skills can be practiced. One of the most valuable and rewarding experiences to the seminar students and teachers is the discussion group.

A good group discussion CAN do the following:

1. Be supportive to the bashful child.
2. Give children the chance to express opinions.

3. Develop reasoning ability.
4. Be a problem solving situation.
5. Teach children to learn to accept and appreciate differences in others.
6. Develop different viewpoints.
7. Help children learn to modify behavior.

Some teachers are quick to say that they ALWAYS have discussions in their room. But do they really??

A group discussion is NOT the following:

1. The teacher talking to the students.
2. The teacher just asking questions.
3. The teacher rationalizing by saying, "I let my children talk."
4. The teacher saying, "We've always had freedom in my room."
5. The students sitting and talking together.

A good group discussion should be neither a bull session nor a debate. Its purpose should be to search for and discover personal meanings. Good discussion groups take time to form. The members must discover each other as being sincere and friendly before a good group discussion can come about.

There are two kinds of discussion groups in general use in teaching. One of these is the decision group. The primary purpose of this group is to arrive at a consensus or decision. The decision group is helpful in bringing about an agreement on a plan of action; however, it has some limitations. Members of the decision group must arrive at an approved solution. Therefore, the individual may not have the freedom to explore in directions which satisfy his own needs.

The "exploratory" or "learning" group is a second type of discussion group. It is used to help each individual to explore ideas and discover meanings through interaction with other people. It involves the exploration of feelings, beliefs, fears and uncertainties. This type of discussion also allows for the development of divergent thinking as the student seeks various alternatives in dealing with issues. Students are not limited in their search for solutions but are free to explore a variety of possibilities. The exploratory group discussion is best for the cultivation of original and creative thinking.

The success or failure of any discussion group depends upon the type questions used to elicit responses from the students. One of the basic ways by which the teacher stimulates student thinking and learning is through the use of effective questioning techniques. Good questions recognize the wide possibilities of thought and are built around varying forms of thinking. Good questions are directed toward learning and evaluative thinking, rather than determining what has been learned in a narrow sense. Proper questioning is an art that can and should be mastered by all teachers.

Examine the following questions to see if you can find some similarities in the type questions you ask.

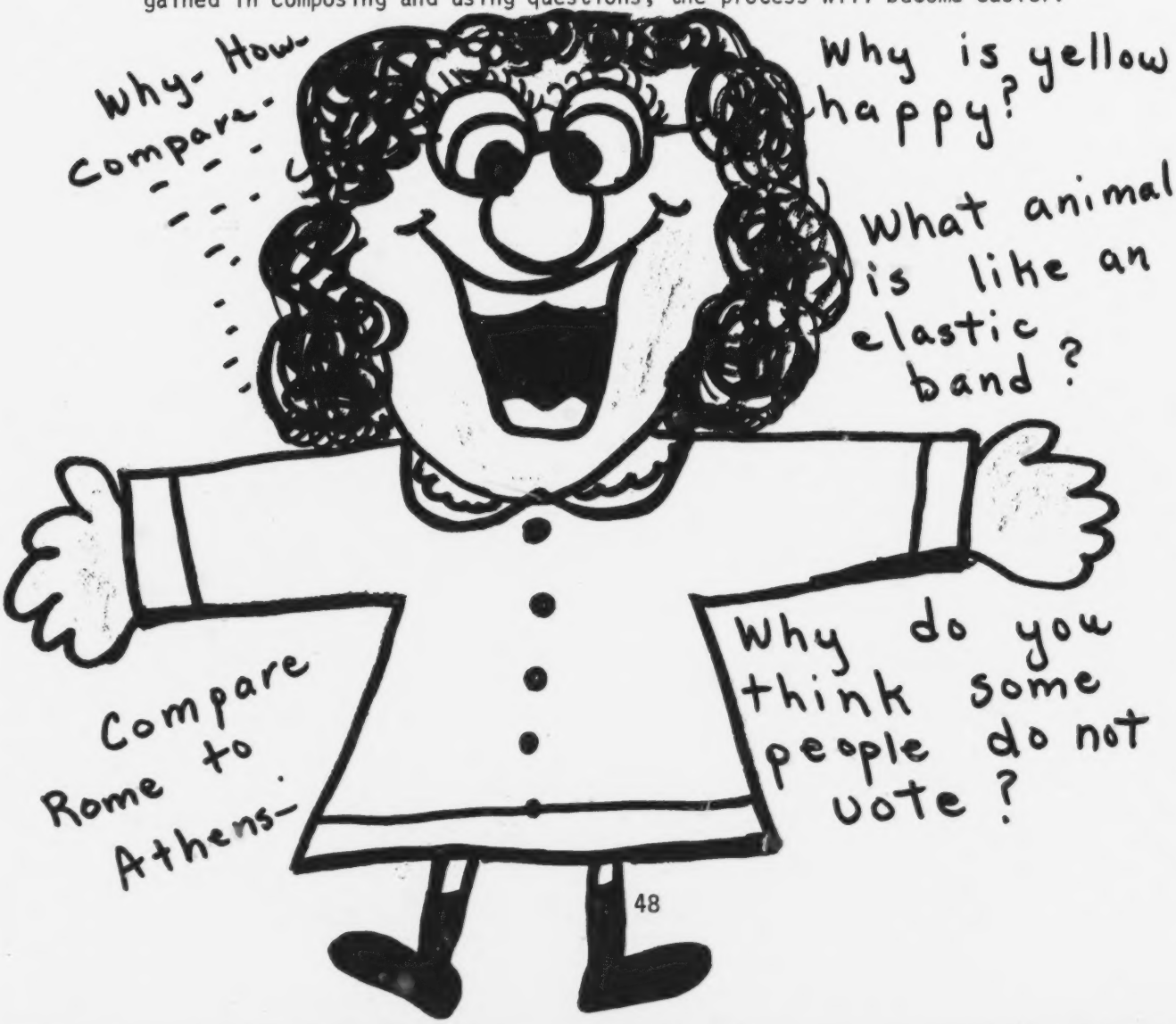
1. Who was Paul Revere?
2. How many ships did Columbus have?
3. What is an odometer?
4. Define peninsula.

If these are typical examples of questions you use, then you are not requiring your students to think. These questions merely require students to recall what they have memorized, rather than requiring them to do any original thinking. Far too many teachers ask recall questions that require students to remember, and few teachers make use of all the worthwhile kinds of questions which require students to think.

The CLUE staff has sought to insure the proper use of questioning techniques through studying and applying Bloom's Taxonomy in our questioning. This approach makes use of a systematic consideration of questions that require students to use ideas, rather than simply to remember them. Enclosed on the following page is a condensed version of Bloom's Taxonomy. Examine it and notice the classifications, beginning with the knowledge level and ending with evaluations. Included with each level of the taxonomy classification are question cues applicable to the various levels of thinking. If you want to ask a question at the knowledge level, then you would begin your question with one of

the words following that level -- tell, list, describe, etc. Bloom's Taxonomy is sequential and cumulative, which means that each level builds upon prior levels. A question on the evaluation level would include, in addition to its own unique elements, some form of all the lower categories.

When planning class discussions, the use of Bloom's Taxonomy should be incorporated to insure that the questions demand students to develop the higher levels of thinking. Teachers should not expect questions of high quality to flow freely when first attempting to do this. Good questions are difficult to compose. However, as more experience is gained in composing and using questions, the process will become easier.


Why- How- Compare-
Why is yellow happy?
What animal is like an elastic band?
Compare Rome to Athens-
Why do you think some people do not vote?

BLOOM'S Sequential Classification of Question Cues:

Knowledge (memory questions)
This is mainly recall or fact kind of questions.

Question cues: Tell - list - describe - who - when - where - which - what - do you remember - state - does - define - identify - did you know - relate -

Comprehension (translate)
Student has to have some knowledge. The difference here is that the student is required to restate the information in his own way.

Question cues: Change to different symbol or medium - tell in your own words - describe how you feel about - relate - interpret - compare and contrast - what is an analogy to - when can you extrapolate from that - discover and explain - what does it mean - what are the relationships -

Application (problem-solving)
Requires the student to explain.

Question cues: Demonstrate - use it to solve - where does it lead you - how can you use it -

Analysis (reached, derived)
Requires the student to break down the information into parts.

Question cues: How - reason - why - what are causes - what are consequences - what are the steps of the process - how would you start - arrange - specify the conditions - which are necessary for - which one comes first, last - what are some specific examples of - list all the problems, solutions -

Synthesis (productive-divergent thinking, originality and imagination)
Requires high degree of original thinking and ingenuity from the student.

Question cues: Create - devise - design - how many hypotheses can you suggest - think of all the different ways - how else - what would happen if - think of as many as

you can - what it would be like if - how many ways are possible - compose - develop - in what ways can you improve - suppose - form a new - think of something no one else has thought of before -

Evaluation (judge to a standard, set criteria)
The highest level -- contains elements of all the previous levels.

Question cues: Set standards for evaluating the following - which are good, bad - which one(s) do you like - what do you think are the most likely - rate from good to poor - select and choose - is that good or bad - weigh according to - evaluate the results - judge according to these standards - judge by how you feel - what is the problem - are these solutions adequate - will it work - decide which -

* * *

Some general suggestions which will help to make the group discussion more profitable for all concerned are as follows:

1. A sense of relaxation must be present for good thinking. The discussion should not be wandering, hurried or tense. Periods of silence are a normal function of group discussions and should not be alarming.

2. Participation must not be measured solely on verbal response. For some people this is a difficult task. Group members should not feel pressured to respond.

3. The atmosphere should be one of friendliness and acceptance in an honest search for understanding. Nothing inhibits people quicker than being threatened, ridiculed or humiliated.

4. The discussion leader needs to set some ground rules. Some suggestions are:

    a. Speak whenever you feel the need to do so. However, if several people wish to speak at the same time, look to the leader who will give direction and recognition for speaking.

    b. Preserve group cohesiveness by limiting side conversations.

c. Try to express yourself without embarrassing or humiliating others. Invite comments and criticisms of your contributions.

5. The leader should not let his viewpoints be known because students will then tend to say what they think he wants them to say.

6. The leader should control his facial expression. Children are perceptive. A raised eyebrow, etc. would tend to discourage some children from expressing an opinion.

7. Questions should be asked that require students to engage in higher levels of thinking.

Topics for group discussions are unlimited. A creative and alert teacher can take advantage of many different sources and situations to get interesting and thought-provoking topics. Although most group discussions require prior planning by the teacher, some can be spontaneous in nature and evolve from an immediate interest of the students.

Some of the sources used by the CLUE staff to develop topics of interest are as follows:

1. Current issues in the community (newspaper or magazine article). The examples below were taken from newspaper articles.

   Topic: "Better Before Bigger"

   Background: A common motto heard around Memphis these days is "Better Before Bigger". Columnists such as Robert Johnson in the Memphis Press-Scimitar and organizations such as the Memphis Chamber of Commerce maintain that Memphis should improve on what it has (schools, streets, services, housing, etc.) before it tries to achieve the bigness of Atlanta or Chicago.

   They believe Memphis will only be getting more problems, higher crime rates, etc. Others point to Atlanta saying that only a few years ago it was the size of Memphis, but now it is a thriving metropolis with the title of "New York of the South". They, too, want Memphis to move ahead like Atlanta.

   Possible Questions:

   1. Do you agree or disagree with the motto "Better Before Bigger"? Why or why not?
   2. What advantages can you think of in Memphis trying to achieve the bigness of Atlanta or Chicago?
   3. What kinds of problems might arise with the increased size of Memphis?
   4. How could these problems be eliminated before they arise?

5. What suggestions can you give for improving Memphis and making it a better place to live?

6. Does the size of a city determine the desirability for living? Why or why not?

Topic; The Idiot Box

Background: Critics of American commerical T.V. say it has no relevancy. They say that it requires no thinking on the part of the viewer, and that commercial T.V. is too readily influenced by sponsors and low ratings. If a so-called "good" program receives low ratings, it is taken off the air. Terms such as the "Idiot Box" and a "Vast Wasteland" have been coined to describe commercial T.V.

Possible Questions:

1. Why do you think commercial T. V. has been termed the "Idiot Box"?

2. Do you agree or disagree that the majority of the T. V. programs are a waste of time? Why? Be specific.

3. How would you improve the quality of commercial T.V.?

4. What things would you take into consideration in trying to improve the ratings?

5. How has television been a factor in advancing our society's technology, communication, education?

2. Film or Filmstrip

Example: Using the film "The Apple"
This film tells the story of a rabbit, a crow and a porcupine who are taught by a bear that it is better to share than to fight.

Possible Questions:

1. Can you tell in your own words what happened in this film?

2. What factors made the rabbit, the crow and the porcupine behave as they did?

3. If the bear were a person, what kind of person would he be?

4. What would have happened if the bear had not taught the other three animals the lesson he did?

5. What are some other ways this film may have ended?

6. Which animal did you like the best? Why?

3. Popular records such as "One Tin Soldier," "American Pie," "Desiderata, " "Smiling Faces," etc.

Example: "A Different Drummer"

Possible Questions:

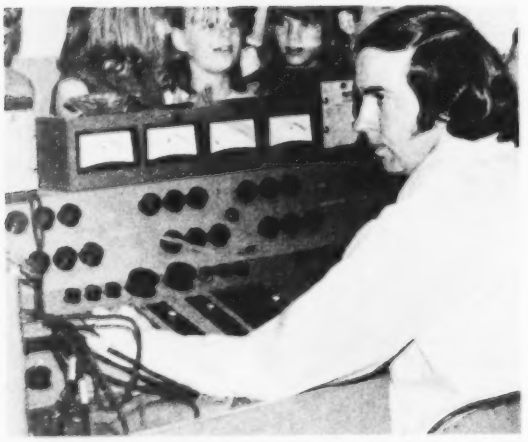
1. Why is the sound effect technique used in this recording important to the total effect of the record?

2. How could you compare this record to the world you live in today?

3. Do you think the world is composed of different drummers? Explain.

If "One Tin Soldier" were used, the opening question could be --

Why does the song begin with the phrase, "Listen Children....?"



4. Assigned reading of story or poem

   Examples: "The Way Home" by Richard Gordon
   "The Golden Crane" by Tohr Yamaguchi
   "The Last Word of a Bluebird as Told to a Child" by Robert Frost
   "Mother to Son" by Langston Hughes

5. Unfinished stories from NEA Journals

   Examples: "What Should Mary Do?"
   "What Should Andy Do?", etc.

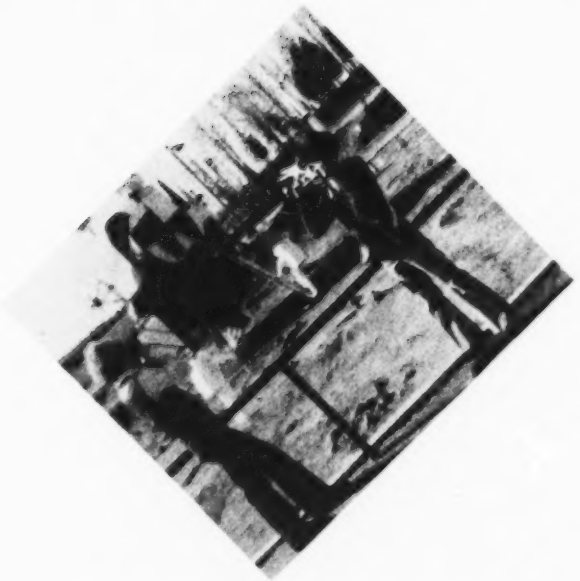
6. Other topics of specific interest of the students

   Examples: Drugs
   Current movies
   Outstanding or unusual television programs

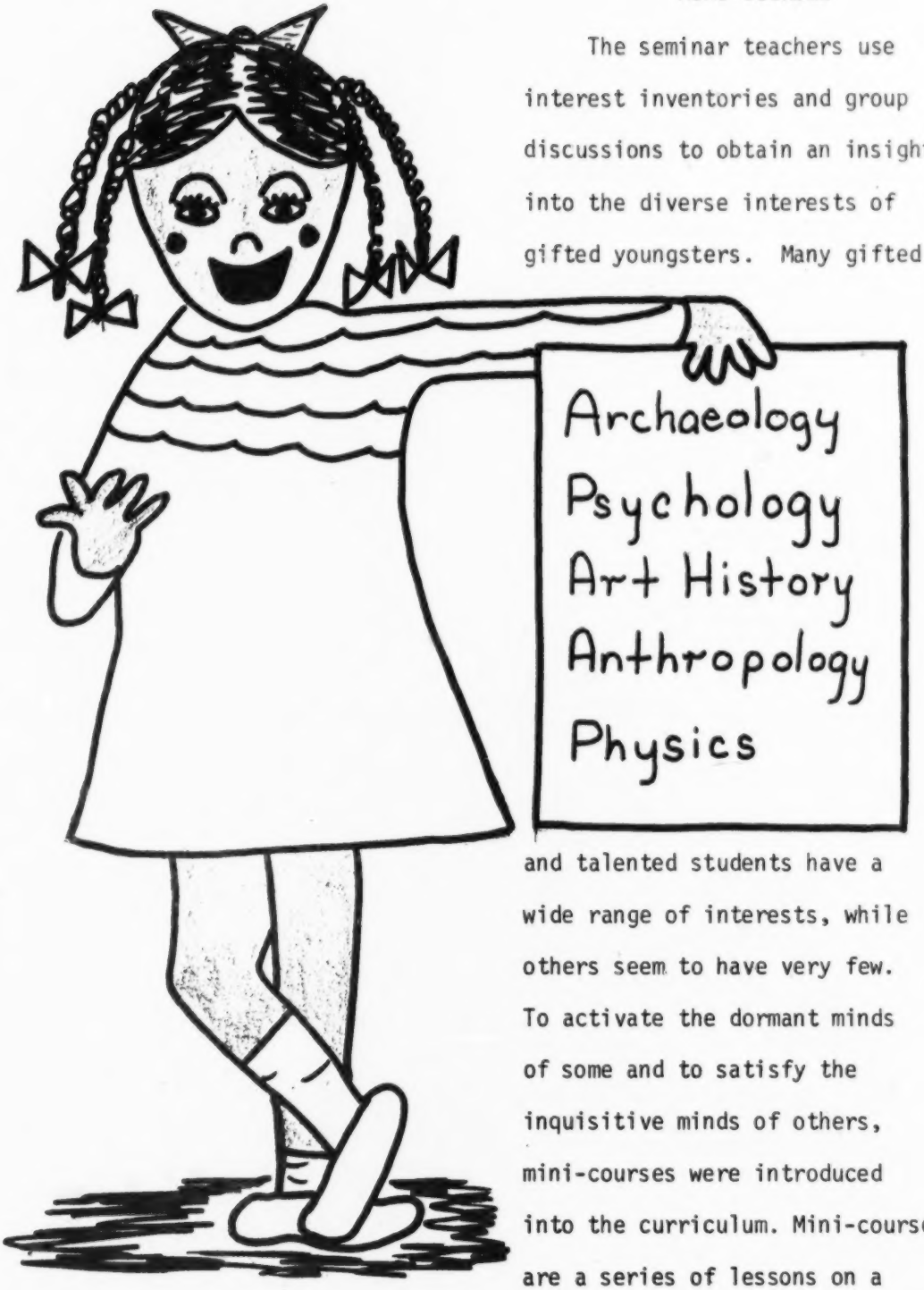
7. A given situation, real or hypothetical

   Examples:

   1. Problem that has arisen in the classroon.
   2. Question: "Can people build cities on the moon?"



MINI-COURSES



The seminar teachers use interest inventories and group discussions to obtain an insight into the diverse interests of gifted youngsters. Many gifted and talented students have a wide range of interests, while others seem to have very few. To activate the dormant minds of some and to satisfy the inquisitive minds of others, mini-courses were introduced into the curriculum. Mini-courses are a series of lessons on a

particular topic. The number of lessons may vary depending upon the interest of the students and the material available.

The students frequently give suggestions on subject matter that is appealing to them because they have studied it briefly in the regular classroom and would like to acquire further information on the subject. The Heart and Circulatory System is an example of a mini-course that fits this category. At other times the students ask for courses, such as archaeology, that receive little attention in the regular classroom curriculum. The only stipulation for a mini-course is that the material used does not infringe on the regular curriculum. The subject matter for these courses runs the gamut from the arts and humanities through the social, physical and natural sciences.

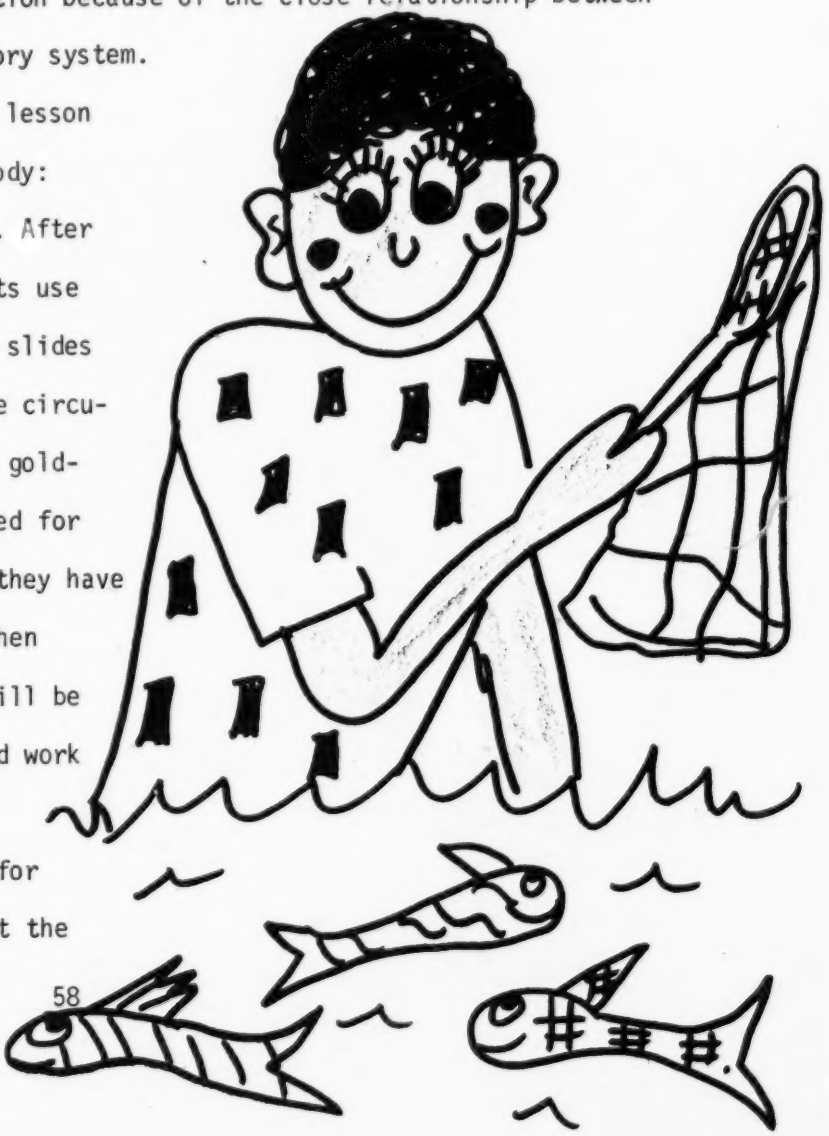
When at all possible, the inquiry method is used in working with most of the subjects. The students find this an exciting way to learn because the activities are student-directed rather than teacher-controlled. Let us now take a brief look at an informal summary of two mini-courses that have been developed.

Heart and Circulatory System

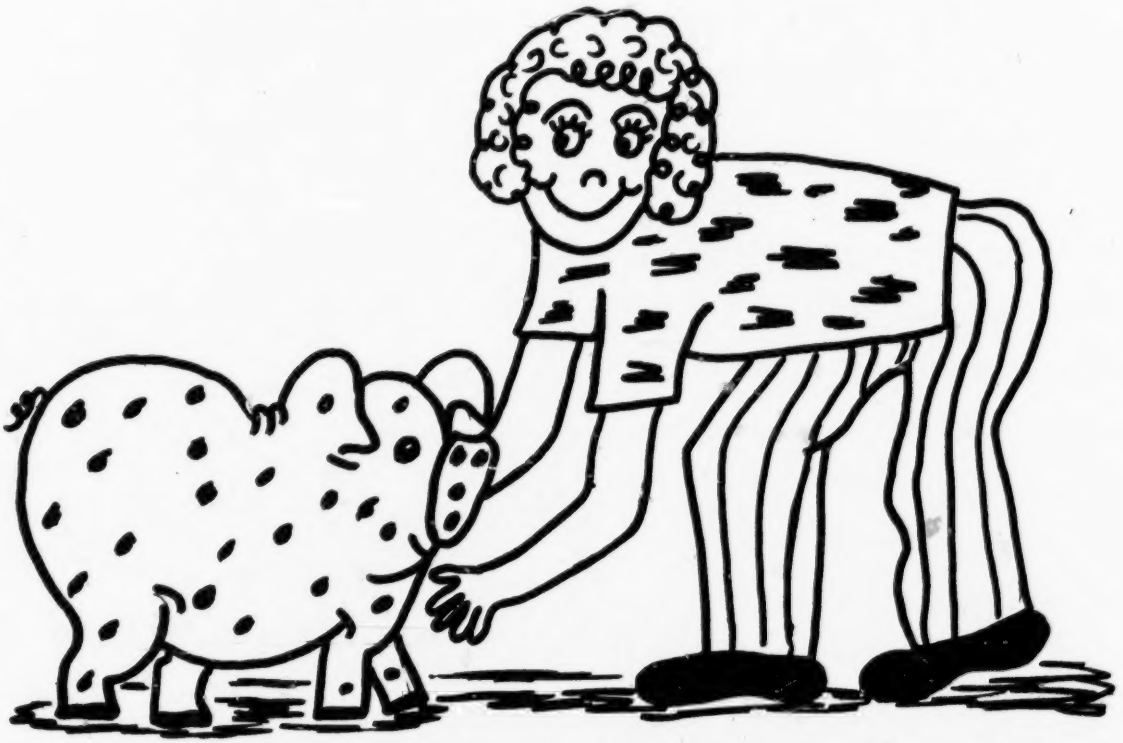
The first lesson on the Heart and Circulatory System begins with a "for fun" pre-test that gives factual information on the heart and circulatory system. The students then work puzzles showing the circulation of blood through the heart. The high point of this lesson is the locating of the pulse spots by the students. In some instances, a child may have difficulty feeling the beat, but panic is averted when we use a stethoscope. They also learn to count their pulse rates and heart beats at rest and after exercise, using a stop watch. Chest expansion is measured after inspiration and expiration because of the close relationship between the circulatory and respiratory system.

To introduce the second lesson a Coronet film, "The Human Body: Circulatory System", is used. After viewing the film, the students use microscopes to view prepared slides of blood cells and to observe circulation in the tail of a live goldfish. Lab sheets are provided for students to illustrate what they have seen. Creative covers are then designed for booklets that will be made to contain materials and work sheets used in the course.

The students are eager for more in-depth knowledge about the

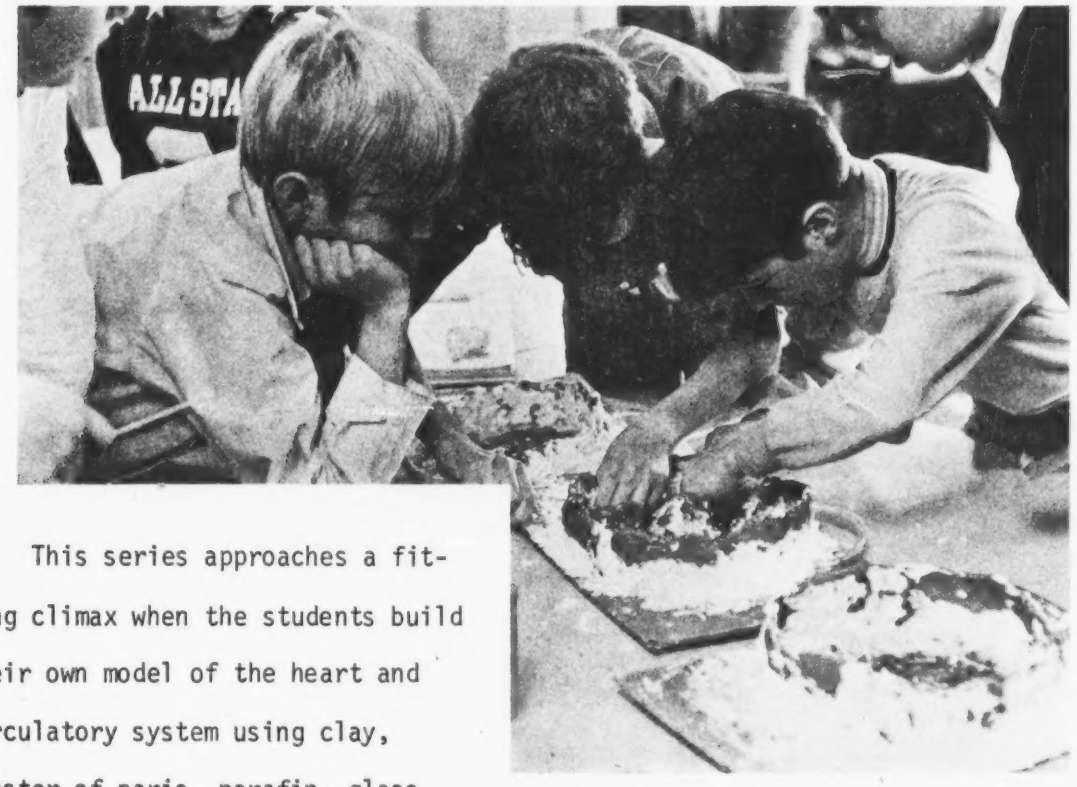


heart, and the third lesson is designed to achieve this goal. An Encyclopedia Britannica film, "The Work of the Heart", explains many facts about the heart and gives some reasons for open-heart surgery. A more detailed study of the heart is done using the Denoyer-Geppart Heart Model and explanatory record. Information about the composition of the blood and the work of the various components of the blood are presented to the students through the use of pictorial transparencies and fact sheets. The students then participate in a creative art activity to demonstrate some knowledge of facts they have gained through this study. "As the Blood Flows" and "Death to the Invaders" are typical of some of the titles for cartoon stories about the heart and circulatory system.



Parts from a freshly slaughtered hog add an unusually high level of excitement to our mini-lesson. For the first time students see what lungs look like. The complete heart, lungs, trachea and esophagus of a hog are

closely examined, poked and daringly touched by students. A pair of kidneys and the liver send students scurrying to encyclopedias and reference books for information concerning the function of these organs in relation to the circulatory system. This information is then presented to other members of the class. Information about various heart diseases is researched and presented by some members of the class through role-playing, skits and interviews. Pamphlets on these diseases were obtained from the American Heart Association. Films, books, pamphlets and magazine articles were used for additional references. Two filmstrips, "Food: Fuel for the Body" (Filmstrip of the Month Club) and Walt Disney's "You the Living Machine" (Encyclopedia Britannica), were made available for those who wanted additional information.



This series approaches a fitting climax when the students build their own model of the heart and circulatory system using clay, plaster of paris, parafin, glass

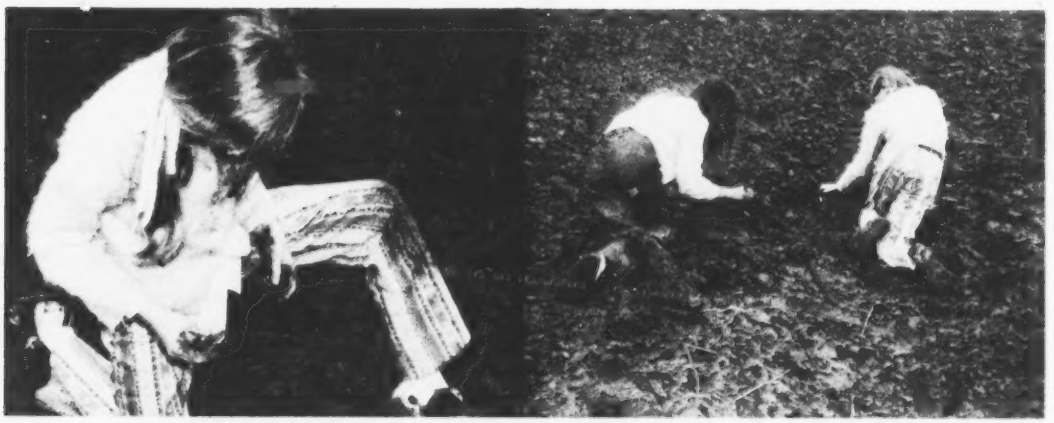
tubing, plastic tubing and colored water. A few ruptures do not dismay these happy students as they exclaim over their working model.

Their excitement builds as we move toward the final experience -- blood typing! They have already returned the permission slips authorizing a registered nurse to prick their fingers, and they pretend to be undergoing mental anguish at the prospect. But when the time actually arrives, they rush to be first in line.

Two drops of blood are placed on a slide for typing, using anti-A and anti-B typing sera. The students then determine their blood type by using an Ortho Blood Typing Chart. Another drop of blood is used for microscopic examination, and some students are able to see some of their white cells and red cells.

Since this subject embraces so many different areas in the science of medicine, a variety of community resources were used. Different

groups have visited the Cardiovascular Computer Center at the University of Tennessee, St. Jude Hospital, the College of Medicine, and blood banks. Specialists have visited the classroom to present information on the Rh factor, sickle cell anemia and other diseases involving hematology. Even though some boys and girls choose topics related to the heart and circulatory system for their independent study, they still request that this same mini-course be offered again. All mini-courses are varied to meet the needs and interests of the students and are never the same with any two groups.



Archaeology

Almost all children who are in intermediate grades have hobbies that involve collecting. The collections may be anything from dolls to fossils, but regardless of the hobby, gifted students are not satisfied with just acquiring a collection. They want to know who made the article, when it was made, where it came from, how it was used, ad infinitum --

One seminar class had a number of students who collected Indian artifacts. It was this group of students who suggested that we have a

mini-course in archaeology, and because so many other youngsters share this interest, archaeology has become a favorite with seminar students. The technical knowledge, artifacts and facilities made available through Mr. Roger Van Cleef of the Memphis Museum and Mr. Ronald Brister of Chucalissa have been important in making this mini-course such a success.

The course begins with a discussion on the subject of archaeology and its purpose. The students also examine an artifact from about 8,000 B.C. and discuss the possible uses it may have had in the prehistoric period. In another class session, a simulated laboratory setting is used, and the students formulate hypotheses as they examine Indian artifacts from the Mid-south area.

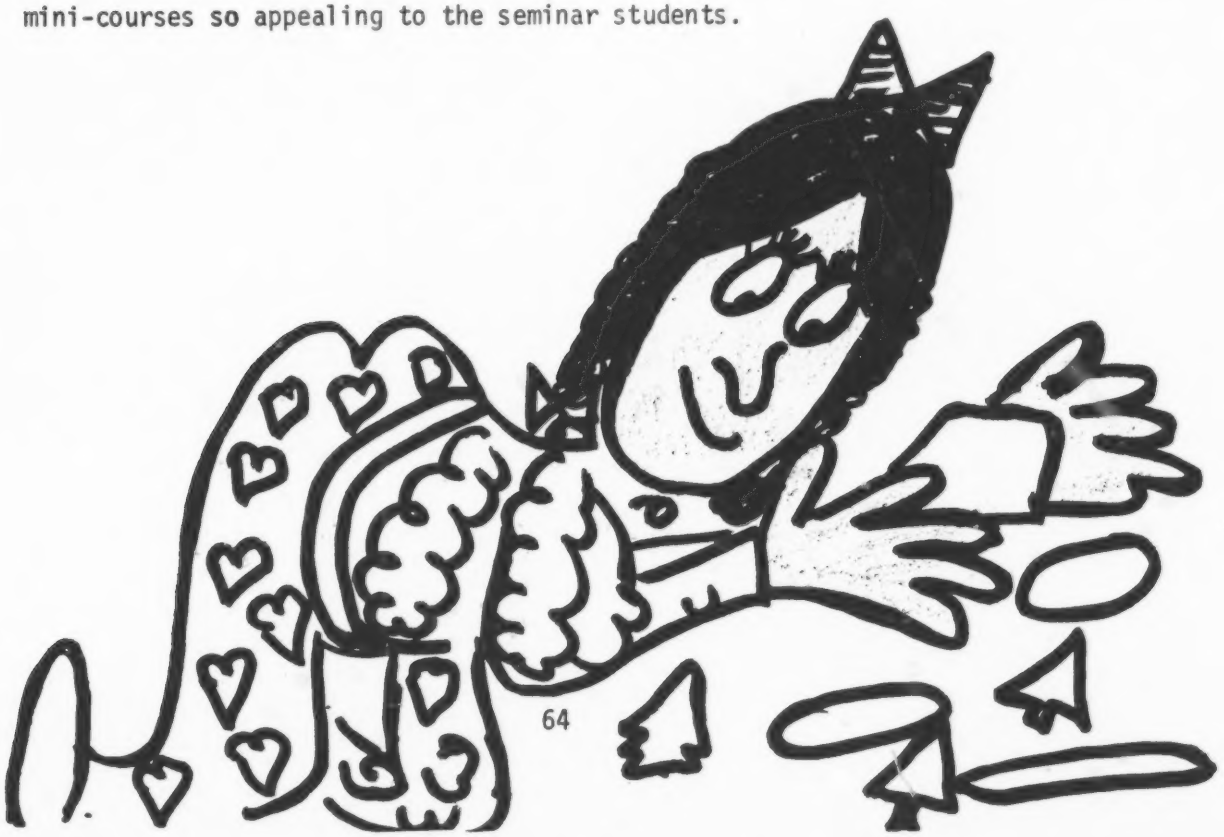
The next two lessons involve research on the prehistoric Indians of this region. Small groups present their topics to other class members through the use of skits, transparencies, puppets, interviews, lectures, clay models, etc. Some students have done extensive research on these topics and have shared their findings through slide and tape productions. These productions are available for loan through the CLUE office.

One of the best ways to learn archaeological techniques is through the use of simulated digs. Transparencies are particularly effective in creating a dig. A set of five transparencies would represent five levels in the stratigraphy of the site. Artifacts that would be found at each level would be illustrated on each transparency. Adrenalin flows freely when three groups compete to be the first to complete their dig. Students can also manufacture "digs" for their classmates. Objects belonging to parents, grandparents, etc., are placed in large cardboard boxes containing layers of excelsior or shredded paper. These simulated

classroom digs prepare the students for surface digs where they search for artifacts near Indian mounds and streams.

Most of the students have visited Chucalissa, which is a reconstructed Indian village and museum. Since Chucalissa is on the site of the original village, many artifacts and skeletal remains have been unearthed in the burial mound. After completing the research and classroom digs, the students view the museum in a new light. Some students have visited the lab to examine equipment and learn the techniques for determining the age of artifacts. On some occasions, they may also see Memphis State archaeology students in the tedious process of excavating a site. Through a seemingly endless amount of dirt, the college students look for artifacts and the distinguishing characteristics of the soil left by post holes from a former home site.

It is this combination of having specimens to examine, experts to question and specific purposes for field explorations that makes mini-courses so appealing to the seminar students.



In order to acquire the necessary background information to prepare a mini-course, the seminar teacher may find it necessary to read college texts and juvenile books on the subject that is to be developed. Try to use as many different classroom activities and community resources as possible. The following outline is a useful guide in developing any mini-course.

OUTLINE

I. Lesson 1 Topic:

   A. Objectives:

      1.

      2.

   B. Learning Activities

      1.

      2.

   C. Materials

      1.

      2.

II. Lesson 2 Topic:
(Each lesson uses a similar format in the planning stage)

III. Lesson 3 Topic:

INDEPENDENT PROJECTS

The term INDEPENDENT PROJECT is used to include work done by an individual student or by two or three students working together. Such projects may be the outgrowth of an entire class study of a given topic, or may be based on the interest of one or more students in an area unrelated to the classroom work.

CHILDREN FIRST MUST GET AN IDEA. This is not as easy as it sounds. Many times the teacher must guide the child in helping him to get an idea. Frequently brainstorming sessions are used. Once the idea has emerged, further help may be needed in focusing on a topic narrow enough to handle, but broad enough to have some depth.

Children have a tendency to pick such broad topics as horses, World War II, insects, etc. If the topic is too broad, one could go in circles and never achieve any type of organization.

WHAT QUESTION IS THE CHILD TRYING TO ANSWER??

WHAT'S THE POINT OF VIEW? Example: World War II. Is the question, "Why did the Japanese bomb Pearl Harbor?" Is the question,"What role did bombers play in the outcome of the war?" In other words what will the project focus be?

So one of the MOST important things to do is to get the topic NARROWED down enough by asking the right question. After this is done, it is much easier for the child to begin his research.

WHAT IS THE TEACHER'S ROLE?

The teacher plays many roles. He/she is a motivator, a counselor, a facilitator, a sharer and a negotiator. These various roles are always in response to individual student needs and interests. Reasonable effort is made by the teacher to provide each student with opportunities to engage in activities that will develop individual interests.

HOW DOES THE TEACHER HELP DEVELOP AN INTEREST?

The following suggestions may be helpful if some children are floundering for a topic and want to broaden their knowledge in an area completely foreign to them.

1. Many different types of magazines can be brought in for the children to look through. (Field & Stream, Mechanics, Life, Time, Saturday Review, etc.)
2. Books on numerous topics can be displayed.
3. Films unrelated to any previous study can be shown.
4. Special interest field trips can be scheduled.
   G.L.L. FARMS -- This is the home of Carbon Copy and a breeding farm for Tennessee Walking horses.
   Memphis State University Chemistry Lab -- Demonstrations can be arranged for the children to see chemistry experiments. Perhaps a tour of the labs may be of interest.
   Great Expectations -- This is an art gallery. There are paintings, sculptures and crafts which may interest some students to choose a related topic.
5. Guest speakers can be scheduled (archaeologist, herpetologists, psychologists, travelers) to acquaint the students with these topics.

After the child or small group has chosen a topic, then the research begins.

WHAT IS RESEARCH?

Some of these gifted students rebel at the conventional book-oriented research paper. Too often this type of research is the only kind required of them. Why? Research tells us that gifted children

often are the first through with an assignment. They consume information rapidly. Thus, the gifted student has an abundance of free time. The research paper keeps these students occupied but not interested. No wonder so many of them rebel at this type of research!

There are many ways to approach research. Opportunities should be provided for various types, from the more conventional book-oriented study to the man-on-the-street interview. The nature of the project determines the nature of the research. Research can be:

1. Interviewing experts who know something about the topic. Famous people such as Issac Hayes, Nancy Tatum, Carroll Cloar, have readily agreed to allow children to interview them. They were extremely gracious and generous with their time. The child should tape the interview for future reference. (Suggestions for preparing students for the interviews are included in the section following this one).

2. Taking field trips to such places as: Memphis House Drug Rehabilitation, Pink Palace Museum, Overton Square, St. Jude Hospital, Carroll Cloar's Studio, etc.

3. Viewing films. If a project is on ecology, the film "What is Ecology?" could be used. Order the film for the child. Let him or his group view it for possible information on the topic.

4. Viewing filmstrips or slides which may be obtained from the school library.

5. Gathering information from periodicals, Science Digest, Science World , etc.

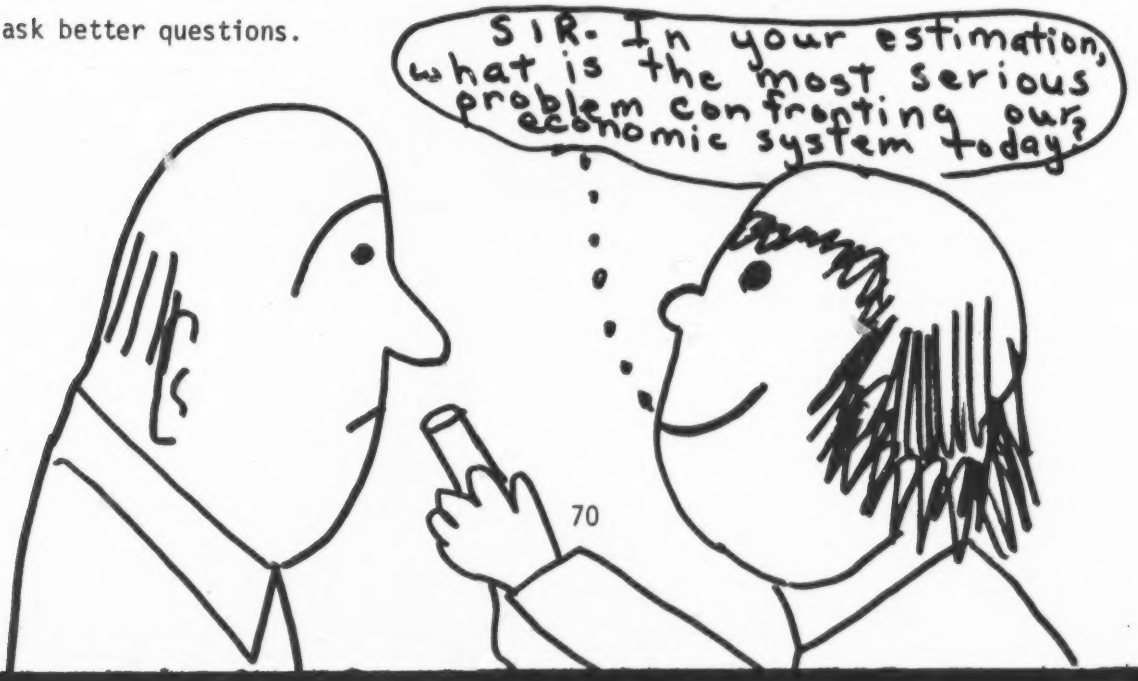
6. Reading books.

7. Searching through library files of old newspapers.

The point is that there are many different ways a child may do research!! Be flexible -- books are important, but they aren't the ONLY way!

SPEAKING OF INTERVIEWS

If an "expert" is kind enough to grant an interview, then the student or students should be well prepared. This means the questions should be illuminating and not pointless. An expert's time is valuable; it is imperative that the students learn the art of interviewing. The following are examples of two activities which help students learn to ask better questions.



Activity 1 -- Small group activity, 3--5 students

Each group decides upon an authority to be interviewed. If the authority is an opera singer, then the group compiles a list of relevant questions. After the small groups have compiled their questions, they come together. The questions from each group are presented to the entire class for evaluation. Are they relevant? Are they phrased in a polite manner? Are they thought-provoking, i.e., do they require more than a yes or no answer? Do they add to the interviewer's knowledge? These are some of the questions that should be considered when evaluating.

Activity 2 -- Small group activity, 3--5 students

Divide the class into several groups. Give each group one of the interviewing activities listed below. Have each child within the group compose at least four questions applicable to the particular situation.

A. An astronaut who has just returned from the galaxy of Andromeda.

B. A twelve year old child who has just invented a cure for the common cold.

C. A ninety-nine year old man who has just broken the record for pole vaulting.

D. A prominent journalist who has just won the Pulitizer Prize for writing.

E. A physicist who has just discovered a way for man to travel faster than the speed of light.

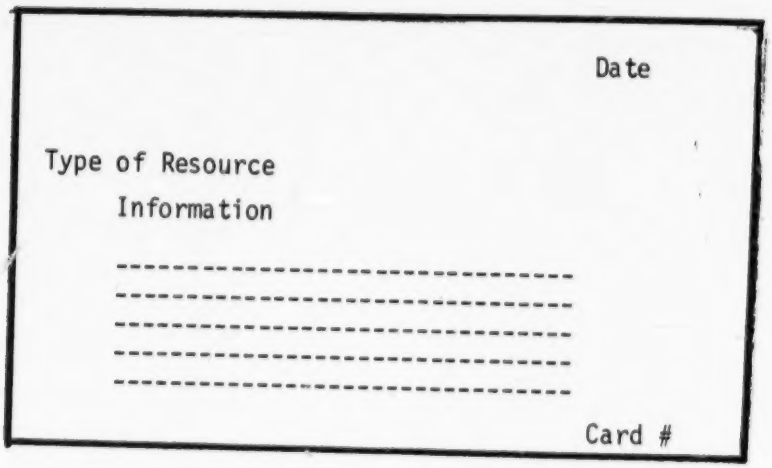
Have each group role-play an interviewing session, with one child assuming the role of the person to be interviewed and the others assuming the role of the interviewers.

Note: When conducting the actual interview, the students should always give the appearance of being well organized. If possible, a tape recorder should be used to record the interview. If, however, the student has to record notes using pad and pencil, he should not attempt to copy verbatim but should paraphrase what the subject is saying. He should always record the date of the interview and the name of the person interviewed.

HOW DOES THE STUDENT KEEP TRACK OF HIS RESEARCH?

Here the teacher as an "expert advisor" makes sure that the student learns, without undue frustration, how to make use of his research. There must be an orderly method of arranging the information gathered. Various alternative methods are presented.

The use of 3 X 5 or 5 X 7 index cards is a good method.



HOW CAN THE STUDENT PRESENT HIS NEW FOUND KNOWLEDGE TO THE WORLD?

There are many unique ways for students to impart their knowledge --

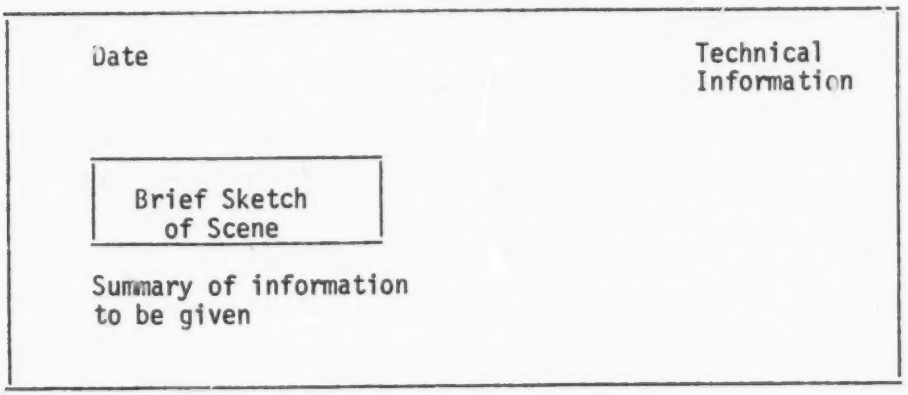
Animated Films plus tape
8mm films
Filmstrips
Transparencies
Color Lifts
Models
Illustrations
Tape Shows
Research papers
V.T.R. (Video Tape Recorder)
Slides and Tapes

After the student has made a decision about how he wishes to share his research, he is ready to organize his material through the use of planning cards or a planning board.

HOW TO MAKE PLANNING CARDS AND PLANNING BOARDS

Planning is a must. The planning card technique can be used with filming and other projects.

Students can use 3 X 5 or 5 X 7 index cards -- or can make their own out of white construction paper. The student will use all the information gathered from his research to make the planning cards for the slide show.



Technical information would include sound effects (roar of ocean, birds chirping, etc.), background music (name of record).

Brief sketch of scene. This means exactly what it says. If real photographs are used, a brief sketch still should be made for organizational purposes.

After the student has completed his planning cards, he can spread them out, reshuffling the order if necessary.

Planning boards are also a very good organizational technique for slide presentations or animated movies. The students use an 18 x 24 piece of white construction paper folded into sixteen squares. The same information that is placed on planning cards is placed in the individual squares on a planning board. If the project is a creative one, a brief sketch of each scene would be placed in the squares. If, however, use is made of pictures from magazines, books, etc., the page number and name of the source would be placed in squares. The whole project is planned in sequence.

Once the planning board or planning cards are completed, the student is then ready to begin work on his actual project. He will be using the particular technique that he has chosen for sharing research.

ANIMATED FILMS

Yvonne Anderson has published two books which explain how to make animated films: Make Your Own Animated Movies and Teaching Film Animation to Children. These books are available in most libraries.

To make animated films it is necessary to have a super 8 camera, floodlights and a tripod. The super 8 camera is mounted on the tripod for filming animation. These cameras are very easy for children to operate. Film animation is an interesting technique, and students have enjoyed using this medium to present their research.

A unique kind of film animation is pixillation. Live characters assume the roles of animated characters and enact an original story or play. For more detailed instruction in this filming technique, consult Teaching Film Animation to Children.

8mm FILMS

Students may want to record a special event on film. Outstanding sporting events, field trips or original plays are good subjects for short movies.

TRANSPARENCIES

The students could choose to use acetate sheets for illustrations, drawings, diagrams, etc. Several overlays can be used to show progression from one stage to another. These can be shown on an overhead, accompanied by a script containing the information they want to share from their research.

A COLORLIFT is an interesting kind of transparency which is made from a colored magazine picture. The magazines used should be those containing high clay content photographs, such as National Geographic. Use the following procedure in making the colorlift.

1) Cover the picture with clear contact paper.

2) Apply heat, using an electric iron, thermofax copier or a laminating machine.

3) Soak picture in solution of warm water and detergent until picture separates from the contact paper -- approximately five minutes.

4) Remove and blot off water.

An exact replica of the picture should be left on the contact paper. This makes an excellent transparency. This method is quite effective, particularly if pictures are an important part of the research.

MODELS

Clay, papier-mache', wood, wire, metal, popsicle sticks, cardboard, etc.

RESEARCH PAPERS

Self-explanatory

V.T.R. - VIDEO TAPE RECORDER

Children can make their own T.V. programs using video tape recorder, camera and monitor. If a child has an interest in science, an experiment can be planned and filmed to be shown at a later date. Plays can also be taped. The teacher may want to tape a practice session of a puppet show or other presentation so that it may be critiqued.

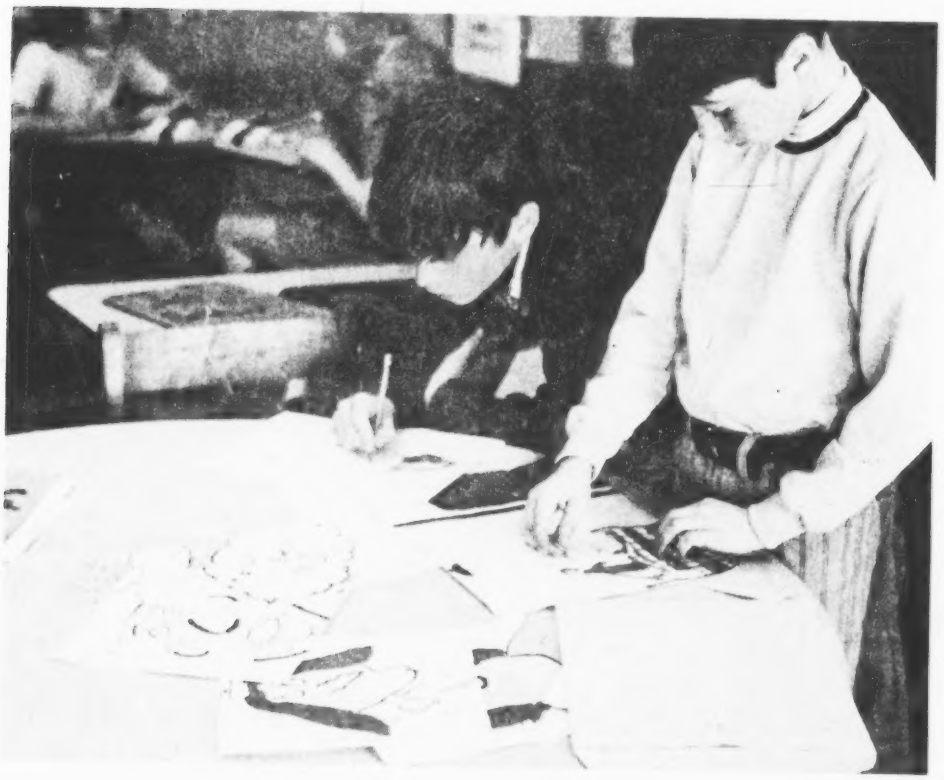
SLIDE SHOW

There are several different kinds of slide presentations. The student may select the one that best suits his particular research.

1. There can be slides made on location or in the classroom, using any camera that makes color slides.
2. Slides can be made of student illustrations, pictures from books or actual objects, using the

Ektagraphic Visualmaker Kit made by the Kodak Company. This is an excellent piece of equipment for student use. It is easy to operate and is almost foolproof. The kit consists of an Instamatic cartridge camera, two visual maker stands and an informative booklet explaining its use.

3. Any combination of slides can be used in a single presentation.



A helpful booklet containing additional suggestions for slide shows is Slides With a Purpose for Business and Education, which can be obtained from the Eastman Kodak Company.

FILMSTRIPS

An Olympus Pen-FT 35mm camera is used for the filming of filmstrips. The techniques are very similar to those used for making slides, except that the processed film is not mounted.

TAPING

An audio tape can then be made by the students to accompany their projects. Reel-to-reel or cassette tape recorders can be used. Many tapes may need a sound effect (bell, clicker, whistle, etc.) to indicate a change of scene. Background music often adds to the effectiveness of the tape.

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SCALE FOR RATING BEHAVIORAL CHARACTERISTICS OF SUPERIOR STUDENTS

Joseph S. Renzulli/Robert K. Hartman

Name_____ School _____ Date _____

Part I: Learning Characteristics	1*	2	3	4
1. Has unusually advanced vocabulary for age or grade level; uses terms in a meaningful way; has verbal behavior characterized by "richness" of expression, elaboration, and fluency.				
2. Possesses a large storehouse of information about a variety of topics (beyond the usual interests of youngsters his age).				
3. Has quick mastery and recall of factual information.				
4. Has rapid insight into cause-effect relationships; tries to discover the how and why of things; asks many provocative questions (as distinct from informational or factual questions); wants to know what makes things (or people) "tick".				
5. Has a ready grasp of underlying principles and can quickly make valid generalizations about events, people, or things; looks for similarities and differences in events, people, and things.				
6. Is a keen and alert observer; usually "sees more" or "gets more" out of a story, film, etc. than others.				
7. Reads a great deal on his own; usually prefers adult level books; does not avoid difficult material; may show a preference for biography, autobiography, encyclopedias, and atlases.				
8. Tries to understand complicated material by separating it into its respective parts; reasons things out for himself; sees logical and common sense answers.				
Column Total				
Weight				
Weighted Column Total				

*1 - Seldom or never
2 - Occasionally
3 - Considerably
4 - Almost always

Total _____

Part II: Motivational Characteristics

	1*	2	3	4
1. Becomes absorbed and truly involved in certain topics or problems; is persistent in seeking task completion. (It is sometimes difficult to get him to move on to another topic.)				
2. Is easily bored with routine tasks.				
3. Needs little external motivation to follow through in work that initially excites him.				
4. Strives toward perfection; is self critical; is not easily satisfied with his own speed or products.				
5. Prefers to work independently; requires little direction from teachers.				
6. Is interested in many "adult" problems such as religion, politics, sex, race - more than usual for age level.				
7. Often is self assertive (sometimes even aggressive); stubborn in his beliefs.				
8. Likes to organize and bring structure to things, people, and situations.				
9. Is quite concerned with right and wrong, good and bad; often evaluates and passes judgment on events, people, and things.				
Column Total				
Weight				
Weighted Column Total				
Total				

*1 - Seldom or never
2 - Occasionally
3 - Considerably
4 - Almost always

Part III: Creativity Characteristics

	1*	2	3	4
1. Displays a great deal of curiosity about many things; is constantly asking questions about anything and everything.	___	___	___	___
2. Generates a large number of ideas or solutions to problems and questions; often offers unusual ("way out"), unique, clever responses.	___	___	___	___
3. Is uninhibited in expressions of opinion; is sometimes radical and spirited in disagreement; is tenacious.	___	___	___	___
4. Is a high risk taker; is adventurous and speculative.	___	___	___	___
5. Displays a good deal of intellectual playfulness; fantasizes; imagines ("I wonder what would happen if ... "); manipulates ideas (i.e., changes, elaborates upon them); is often concerned with adapting, improving, and modifying institutions, objects, and systems.	___	___	___	___
6. Displays a keen sense of humor and sees humor in situations that may not appear to be humorous to others.	___	___	___	___
7. Is unusually aware of his impulses and more open to the irrational in himself (freer expression of feminine interest for boys, greater than usual amount of independence for girls); shows emotional sensitivity.	___	___	___	___
8. Is sensitive to beauty; attends to aesthetic characteristics of things.	___	___	___	___
9. Is nonconforming; accepts disorder; is not interested in details; is individualistic; does not fear being different.	___	___	___	___
10. Criticizes constructively; is unwilling to accept authoritarian pronouncements without critical examination.	___	___	___	___
Column Total	___	___	___	___
Weight	___	___	___	___
Weighted Column Total	___	___	___	___
Total	_____			

*1 - Seldom or never
2 - Occasionally
3 - Considerably
4 - Almost always

Part IV: Leadership Characteristics

	1*	2	3	4
1. Carries responsibility well; can be counted on to do what he has promised and usually does it well.	___	___	___	___
2. Is self confident with children his own age as well as adults; seems comfortable when asked to show his work to the class.	___	___	___	___
3. Seems to be well liked by his classmates.	___	___	___	___
4. Is cooperative with teacher and classmates; tends to avoid bickering and is generally easy to get along with.	___	___	___	___
5. Can express himself well; has good verbal facility and is usually well understood.	___	___	___	___
6. Adapts readily to new situations; is flexible in thought and action and does not seem disturbed when the normal routine is changed.	___	___	___	___
7. Seems to enjoy being around other people; is sociable and prefers not to be alone.	___	___	___	___
8. Tends to dominate others when they are around; generally directs the activity in which he is involved.	___	___	___	___
9. Participates in most social activities connected with the school; can be counted on to be there if anyone is.	___	___	___	___
10. Excels in athletic activities; is well coordinated and enjoys all sorts of athletic games.	___	___	___	___
Column Total	___	___	___	___
Weight	___	___	___	___
Weighted Column Total	___	___	___	___
Total	_____			

*1 - Seldom or never
2 - Occasionally
3 - Considerably
4 - Almost always